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SAT® SUITE
OF ASSESSMENTS

Alignment to Colorado Standards

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Executive Summary

This report details College Board's study of the alignment between the Colorado Academic Standards (CAS) and the digital SAT® Suite of Assessments. Though not designed to align to any single set of academic content standards, the digital SAT Suite tests are firmly grounded in the same sorts of high-quality evidence used by states and others to develop their college and career readiness standards, meaning that states such as Colorado may employ the tests as valid, reliable, and fair assessments of their students' attainment of key postsecondary prerequisites.

The key features of the digital SAT Suite's Reading and Writing section are

- the use of a specified range of text complexity consistent with college and workforce training requirements;
- an emphasis on close reading and use of evidence, both textual and quantitative;
- the inclusion of data and informational graphics, which students must analyze in conjunction with text;
- a focus on the use and meaning of high-utility words and phrases in context;
- attention to a core set of important Standard English conventions and to effective written expression more generally; and
- the requirement that students work and demonstrate facility with texts across a wide range of disciplines, including literature, history/social studies, the humanities, and science.

The key features of the digital SAT Suite's Math section are

- a strong focus on the content that matters most for college and career readiness and success;
- an emphasis on rich applied problems in real-life settings in which the use of mathematical practices is integrated with the content;
- a balance of fluency, conceptual understanding, and application items within and across all content topics; and
- an emphasis on problem-solving and data analysis.

Based on a thorough review of the Colorado Academic Standards, we find that the digital SAT Suite **strongly aligns** and thereby supports students' progress toward educational and workplace success.[1] The following table provides detail by program and grade level/course:

Colorado Academic Standards	College Board Assessment	Degree of Alignment
Grades 11–12 English Language Arts	SAT	Very strong
Grades 9–10 English Language Arts	PSAT/NMSQT and PSAT 10	Very strong
Grades 9–10 English Language Arts	PSAT 8/9	Very strong
Algebra I, Integrated Math I and II	SAT	Strong
Algebra I, Integrated Math I and II	PSAT/NMSQT and PSAT 10	Strong
Algebra I, Integrated Math I and II	PSAT 8/9	Strong

In the sections that follow, we offer a description of our alignment methodology and a more detailed summary of our findings in each content area. Appendices to this document provide alignment tables for each grade/course and subject area.

[1] In his widely published research on the alignment of educational expectations with large-scale assessment systems, Norman Webb asserts, among other criteria, that at least 50% of the skills within a content category should have at least one related assessment item. When looking at alignment matches between the CAS and the testing domains of the SAT Suite, our team found the alignment to be "strong" (equal to or greater than 50% of standards aligned) to "very strong" (equal to or greater than 75% of standards aligned). See Norman L. Webb, "Issues Related to Judging the Alignment of Curriculum Standards and Assessments," *Applied Measurement in Education* 20, no. 1 (December 2007): 7–25. https://www.cehd.umn.edu/edpsych/c-bas-r/docs/webb2007.pdf.

Section 1: Alignment Summary

In his widely published research on alignment, Norman Webb writes, "Assessments, as well as curricula, designed to fulfill expectations and standards are constrained by very pragmatic factors such as time, sequencing, and a high variation in the rate of learning. These constraints force those who develop assessments to make decisions about the amount of emphasis or weight that will be given to different topics[2] on a test." He explains that a successful assessment program does not need to assess every academic standard. He goes on to define the criteria by which an assessment program can measure itself, using a "scale of agreement" whereby an acceptable alignment can be achieved when "assessments cover a sufficient number of topics in expectations so that a student judged to have acceptable knowledge on the assessments will have demonstrated some knowledge on nearly all topics in expectations."[3]

Webb goes on to write that "judging alignment is strengthened by using specific criteria to analyze agreement among expectations and assessments." One of these specific criteria is *categorial concurrence*, which is achieved when "the same or consistent categories of content appear in both expectations and assessments."

There is strong concurrence between the SAT Suite and the categories of knowledge defined in the Colorado Academic Standards. While not every standard is assessed within the SAT Suite, nearly all domains are represented, and a variety of standards are sampled from each domain. In the sections that follow, we provide a detailed summary of alignment between the SAT Suite and the Colorado Academic Standards in English Language Arts and Mathematics.

English Language Arts

The Colorado Academic Standards for Reading, Writing, and Communicating represent the essential skills and knowledge students should develop in literacy as they prepare for success in college, career, and life beyond secondary education. The standards require students to use

[2] Webb defines topics as large categories of knowledge "identified by standards or main areas of content specified."

[3] Norman L. Webb, *Criteria for Alignment of Expectations and Assessments in Mathematics and Science Education* (Council of Chief State School Officers and National Institute for Science Education Research Monograph No. 6). (Madison: University of Wisconsin, Wisconsin Center for Education Research, 1997): 23. https://files.eric.ed.gov/fulltext/ED414305.pdf.

"reading skills to fully manage, evaluate, and use the myriad information available in their day-to-day lives" and use writing "as a medium for reasoning and making intellectual connections." Additionally, students are asked to "consider opposing perspectives and address counterarguments to their claims and the evidence they provide in support of their argument."[4]

The digital SAT Suite's Reading and Writing section—administered as part of the SAT, PSAT/NMSQT and PSAT 10, and PSAT 8/9—measures many of the same skills and knowledge emphasized in the Colorado Academic Standards. The primary aim of the Reading and Writing section is to assess students' readiness for college and workforce training with respect to literacy. To that end, the Reading and Writing section focuses on key elements of comprehension, writing, rhetoric, and language conventions that have been identified by the best available evidence as necessary for postsecondary readiness and success.

Students who are successful on the Reading and Writing section will be able to

- demonstrate understanding of **information and ideas** in texts across a range of academic disciplines and complexities aligned with college and career readiness requirements.
- effectively evaluate the **craft and structure** of texts, including demonstrating understanding and proficient use of high-utility academic vocabulary in context.
- revise the **expression of ideas** in texts to enhance communicative power in accordance with specified rhetorical goals.
- edit texts in accordance with **Standard English conventions** in order to meet academic and workplace expectations regarding the use of standardized expression.

College Board's comparison of the digital SAT Suite Reading and Writing section to the CAS for Reading, Writing, and Communicating finds that the alignment is **very strong**. While there are some Colorado standards that the digital SAT Suite is not designed to measure—notably those for oral expression and listening, publication, and research—the suite offers a valid, reliable, and fair assessment of core reading, writing, and language requirements of the CAS for Reading, Writing, and Communicating.

College Board's alignment study looked at each digital SAT Suite program and considered its alignment to the corresponding grade-specific standards in Reading, Writing, and Communicating. Specifically, the study examined the following comparisons:

1. Digital SAT to the standards in grades 11–12 (2020)
2. Digital PSAT/NMSQT and PSAT 10 and PSAT 8/9 to the standards in grades 9–10 (2020)

Below are summaries of College Board's alignments by grade(s) and test(s).

- **Grades 11–12**: Of the 21 standards in Reading for All Purposes and Writing and Composition, 17 (81%) are addressed on the digital SAT. Like its paper-based predecessor, the digital SAT is not designed to assess publication (RWC20.GR.910.S.9.GLE.4.EO.f) or writing over extended time frames (RWC20.GR.1112.S.9.GLE.4.EO.g). The digital SAT does, however, assess students' ability to read, analyze, and reason about a wide array of texts; synthesize information across texts; use textual and quantitative evidence; revise writing for

[4] Colorado Department of Education. *2020 Colorado Academic Standards: Reading, Writing, and Communicating* (Denver: Colorado Department of Education, 2019), 6. https://www.cde.state.co.us/coreadingwriting/2020cas-rw-p12.

development, organization, and style; and edit texts to demonstrate mastery of core conventions of standard English grammar, usage, and punctuation.

- **Grades 9–10**: Of the 21 standards in Reading for All Purposes and Writing and Composition, 17 (81%) are addressed on the digital PSAT/NMSQT and PSAT 10, with the same number of standards addressed on the digital PSAT 8/9. Like their counterparts in the suite, the digital PSAT/NMSQT and PSAT 10 and the digital PSAT 8/9 do not require students to publish their writing or write over extended time frames. However, the tests do assess students' ability to read, analyze, and reason about a wide array of increasingly complex texts (both literary and informational) as well as their ability to revise and edit texts for a wide range of audiences and purposes using core conventions of Standard English.

Readers who wish to see detailed alignments to the digital SAT Suite can find these in **Appendix B: Alignments of ELA Standards to Digital SAT Suite**.

Math

The Colorado Academic Standards for Mathematics define the opportunities at each grade level students should be given to engage with mathematical concepts and develop mathematical practices as they progress through school and prepare for post-secondary work. The standards are organized within the specific mathematical topics of Number and Quantity; Algebra and Functions; Data Analysis, Statistics and Probability; and Geometry. However, interwoven throughout these topics are standards for mathematical practice that require students to solve problems, reason, communicate mathematically, and demonstrate procedural fluency, among other important proficiencies.

The digital SAT Suite's Math section—administered as part of the SAT, PSAT/NMSQT and PSAT 10, and PSAT 8/9—measures many of the same skills and knowledge emphasized in the Colorado Academic Standards. Like the Colorado Academic Standards, the digital SAT Suite Math section is focused on the skills and knowledge that reflect a student's fluency with, understanding of, and ability to apply the math concepts, skills, and practices that are most essential for postsecondary work.

The Math section of the digital SAT Suite is designed to elicit evidence from student performance in support of four broad claims about students' math achievement. To be successful on the Math section, students must be able to

- analyze, fluently solve, and create linear equations and inequalities as well as analyze and fluently solve systems of linear equations and inequalities using multiple techniques (**Algebra**);
- exhibit attainment of skills and knowledge central for progression to more advanced math courses, including analyzing and fluently solving absolute value, quadratic, exponential, polynomial, rational, radical, and other nonlinear functions (**Advanced Math**);
- apply quantitative reasoning about ratios, rates, and proportional relationships; understand and apply unit rate; and analyze and interpret one- and two-variable data (**Problem-Solving and Data Analysis**); and
- solve problems that focus on perimeter, area, and volume; angles, triangles, and (PSAT/NMSQT, PSAT 10, and SAT only) trigonometry; and circles (SAT only) (**Geometry and Trigonometry**).

College Board's comparison of the digital SAT Suite Math section to Colorado's math standards finds that the alignment is strong. College Board's math experts examined each Colorado math standard with respect to the course pathways outlined in the Common Core's Appendix A. Specifically, the team aligned the digital SAT Suite to the following courses:

1. Digital SAT Suite to Algebra I
2. Digital SAT Suite to Integrated Math I
3. Digital SAT Suite to Integrated Math II

In looking at the Colorado Academic Standards for Mathematics, College Board content experts focused on the Grade Level Expectations and Evidence Outcomes. Advanced Outcomes, marked with a (+), represent content which Colorado describes as "best saved for upper-level math courses in a student's final three semesters of high school." These standards were not included in the alignment study as they represent more specialized mathematical skills that go beyond those essential for college and career readiness.

Below are summaries of College Board's alignments by standards category:

- **Algebra I:** Research shows the distinctive importance of algebra with respect to postsecondary success. As a result, there is a strong alignment of the digital SAT Suite to Colorado standards in Algebra I. Of the 47 standards identified for Algebra I, 37 of these (79%) align to the SAT, and 36 (77%) align to the PSAT/NMSQT and PSAT 10 and PSAT 8/9.
- **Integrated Math I:** Of the 43 standards in Integrated Math I, 28 of these (65%) align to the SAT and PSAT/NMSQT and PSAT 10, and 26 (60%) align to the PSAT 8/9. Alignment here is especially strong in Standard 2: Algebra and Functions.
- **Integrated Math II:** Of the 46 standards in Integrated Math II, 30 of these (65%) align to the SAT and PSAT/NMSQT and PSAT 10 , and 25 (54%) align to the PSAT 8/9. Consistent with Integrated Math I, alignment here is especially strong in Standard 2: Algebra and Functions.

Readers who wish to see detailed alignments to the digital SAT Suite can find these in **Appendix C: Alignments of Math Standards to Digital SAT Suite**.

Section 2: The Digital SAT Suite

The following is a brief overview of the digital SAT Suite of Assessments. An exhaustive discussion of the suite and its tests can be found in the ***Assessment Framework for the Digital SAT Suite***.

The *digital SAT Suite of Assessments* is College Board's collective term for its flagship suite of college and career readiness testing programs and services. The digital suite continues and expands on College Board's core commitments to access and opportunity for all students. These commitments include

- offering valid, reliable, fair, and objective assessments of students' academic achievement,
- providing actionable information to students and educators about evidence-based ways to build on academic strengths and to address skill and knowledge shortcomings relevant to college and career readiness,
- connecting students to opportunities they have earned through their hard work in school, such as admission to postsecondary institutions well suited to their achievement and interests as well as scholarships and recognition programs,
- helping state users meet federal accountability requirements through industry-leading assessments, services, and documentation, and
- helping higher education institutions to find and enroll prospective students and then to support those students so that they can be successful on their campuses.

The digital SAT Suite consists of four testing programs, each with its own purpose(s) and target population.

- The **SAT** is typically administered to high school juniors and seniors. The test measures essential prerequisites for postsecondary readiness and success as determined through an extensive, ongoing research process.
- **PSAT/NMSQT** and **PSAT 10** are typically administered to high school sophomores and juniors. PSAT/NMSQT is administered in the fall of each academic year, while PSAT 10 is administered in the spring. The PSAT/NMSQT and PSAT 10 tests are identical in format and content, but only PSAT/NMSQT serves as a qualifying test for the National Merit Scholarship Corporation's annual scholarship program. PSAT/NMSQT and PSAT 10 serve as

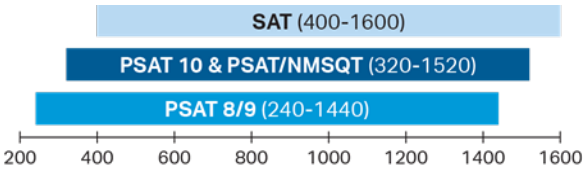
opportunities to check in on students' progress toward postsecondary readiness and to focus students' preparation for post–high school study.

- **PSAT 8/9** is typically administered to eighth and ninth graders and serves as a baseline for assessing students' readiness for college and career.

The four tests measure the same broad knowledge domains and skills, with slight modifications reflecting differences in the age and attainment of students across the secondary grades, making it easier for students, families, and educators to monitor student progress and address any areas of weakness.

Each test in the digital SAT Suite consists of two sections: a Reading and Writing (RW) section and a Math section. Correspondingly, each test yields three scores—two section scores and a total score (the last of which is the arithmetic sum of the section scores)—accompanied by test interpretation tools that allow test takers and their families, educators, and other stakeholders to make informed, data-based decisions about students' educational futures. Scores for all the assessments are on the same vertical scale, allowing meaningful interpretations about students' academic growth as they move between testing programs within the suite.

Figure 1 graphically depicts the total score scales of the digital SAT Suite assessments.



The standard administration[5] for each of the digital SAT Suite tests employs a multistage adaptive test (MST) model. In the digital suite's two-stage MST model, each test section (Reading and Writing; Math) is divided into two separately timed, equal-length portions (*stages*), each consisting of a *module* of test questions. The first module of each test section consists of questions across a broad span of difficulty (i.e., easy, medium, and hard questions) so that a robust if provisional assessment of test taker achievement can be obtained. The customized test delivery platform used for the digital SAT Suite then uses that information to select the second (and final) module to administer to a given test taker. This second module consists of questions that are, on average, more or less difficult than the questions in the first module. Questions from all four Reading and Writing and Math content domains (discussed below) are included in each section's modules; this ensures, in part, that students are sampled fairly on all key content dimensions in the first module prior to being routed to the second in each section. Adaptive testing in this way is highly beneficial to students (and other stakeholders) because the same quality of testing (in terms of desirable content and psychometric properties) is delivered via significantly shorter testing instruments than would be possible if linear (nonadaptive) test forms were used instead.

[5] Although the vast majority of students will take the digital SAT Suite tests electronically on a digital device, paper-based and other accommodations, including linear (nonadaptive) test forms, are available for students with approved accommodations who require them to access the tests and their content. Though not discussed further in this document, the linear test specifications closely mirror those for the digital adaptive tests, although each linear test is slightly longer than its counterpart to account for the lack of adaptivity in linear testing. See Appendix D in the Assessment Framework for the Digital SAT Suite for more information on these linear tests and their specifications.

Question pools for the digital SAT Suite tests are sufficiently large to permit each student to be administered a unique but highly comparable test form, thereby making the tests highly secure while ensuring that each student receives a form tightly aligned with the test's specifications.

Table 1 below summarizes the basic characteristics of the digital SAT Suite tests.

Table 1: Overall Specifications for the Digital SAT Suite Tests

Characteristic	Reading and Writing Section	Math Section
Administration	Two-stage adaptive test design; one Reading and Writing section administered via two separately timed modules	Two-stage adaptive test design; one Math section administered via two separately timed modules
Test length (number of operational and pretest questions)	1st module: 25 operational questions and 2 pretest questions 2nd module: 25 operational questions and 2 pretest questions	1st module: 20 operational questions and 2 pretest questions 2nd module: 20 operational questions and 2 pretest questions
Time per stage	1st module: 32 minutes 2nd module: 32 minutes	1st module: 35 minutes 2nd module: 35 minutes
Total number of questions	54 questions	44 questions
Total time allotted	64 minutes	70 minutes
Average time per question	1.19 minutes	1.59 minutes
Scores reported	Total score Section scores (Reading and Writing; Math)	
Question type(s) used	Discrete; four-option multiple-choice	Discrete; four-option multiple-choice (≈75%) and student-produced response (SPR) (≈25%)
Stimulus subject areas	Literature, history/social studies, humanities, science	Science, social studies, real-world topics
Word count	25–150 (6-character) words per stimulus text	Approximately 30% of questions in context; a majority of in-context questions have 50 (6-character) words or fewer
Informational graphics	Yes; tables, bar graphs, line graphs	Yes
Text complexity bands	Grades 6–8, grades 9–11, grades 12–14 (Grades 12–14 excluded from PSAT 8/9)	N/A[6]

[6] Math contexts are not formally rated for text complexity. However, Math test development staff review each context qualitatively to ensure that its linguistic load and demands are consistent with the requirements of the question being posed, and Math (and Reading and Writing) staff have been trained in linguistic modification principles, which seek to relieve students of unnecessary linguistic burdens during test taking through clear and concise word choice in contexts and questions.

The Reading and Writing Section

The Reading and Writing section of the digital SAT Suite assessments is designed to measure students' attainment of critical college and career readiness prerequisites in literacy in English language arts as well as in various academic disciplines, including literature, history/social studies, the humanities, and science. The Reading and Writing section focuses on key elements of comprehension, rhetoric, and language use that the best available evidence identifies as necessary for postsecondary readiness and success. Over the course of a Reading and Writing section of one of the digital SAT Suite assessments, students answer multiple-choice questions requiring them to read, comprehend, and use information and ideas in texts; analyze the craft and structure of texts; revise texts to improve the rhetorical expression of ideas; and edit texts to conform to core conventions of Standard English.

The construct for the Reading and Writing section is literacy achievement relative to core college and career readiness requirements in English language arts as well as in the academic disciplines of literature, history/social studies, the humanities, and science.

Students who are successful on the Reading and Writing section will be able to

- demonstrate understanding of information and ideas in texts across a range of academic disciplines and complexities aligned with college and career readiness requirements.
- effectively evaluate the craft and structure of texts, including demonstrating understanding and proficient use of high-utility academic vocabulary in context.
- revise the expression of ideas in texts to enhance communicative power in accordance with specified rhetorical goals.
- edit texts in accordance with Standard English conventions in order to meet academic and workplace expectations regarding the use of standardized expression.

Each of the claims listed above corresponds to one of the four content domains that form the architecture of the Reading and Writing section. Table 2 offers a synopsis of the content domain structure of the section, the skill/knowledge testing points addressed in each content domain, and the distribution of operational (non-pretest) questions by domain.

Table 2: Digital SAT Suite Reading and Writing Section Content Domains and Operational Question Distribution

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Information and Ideas	Students will use comprehension, analysis, and reasoning skills and knowledge as well as what is stated and implied in texts (including in any accompanying informational graphics) to locate, interpret, evaluate, and integrate information and ideas.	Central Ideas and Details Command of Evidence • Textual • Quantitative Inferences	≈26%/ 12–14 questions

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Craft and Structure	Students will use comprehension, vocabulary, analysis, synthesis, and reasoning skills and knowledge to use and determine the meaning of high-utility academic words and phrases in context, evaluate texts rhetorically, and make supportable connections between multiple topically related texts.	Words in Context Text Structure and Purpose Cross-Text Connections	≈28%/ 13–15 questions
Expression of Ideas	Students will use revision skills and knowledge to improve the effectiveness of written expression in accordance with specified rhetorical goals.	Rhetorical Synthesis Transitions	≈20%/ 8–12 questions
Standard English Conventions	Students will use editing skills and knowledge to make text conform to core conventions of Standard English sentence structure, usage, and punctuation.	Boundaries Form, Structure, and Sense	≈26%/ 11–15 questions

All questions on the Reading and Writing section are four-option multiple-choice in format, with a single best answer for each question.

Questions in the Reading and Writing section are broken down into *content domains*, *skills*, and *task groups* and are also associated with one of four *subject areas* representing the content area of the passage(s) used as stimuli. *Content domains*, as discussed above, are the four large categories of skills and knowledge assessed on the digital SAT Suite tests: Information and Ideas, Craft and Structure, Expression of Ideas, and Standard English Conventions. Each of these domains is further broken down into *skills*, otherwise known as skill/knowledge testing points, which identify the range of skills and knowledge assessed in the section. *Task groups* associated with each skill identify the range of testable approaches within each skill. For example, a Central Ideas and Details question (a skill in the Information and Ideas content domain) may assess either an explicit or implicit central idea or detail. Subject area tags indicate which of the four content areas—literature (LIT), history/social studies (HSS), the humanities (HUM), and science (SCI)—is(are) eligible to be represented in the stimuli associated with each task group. To continue the previous example, Central Ideas and Details questions, whether focused on explicit or implicit ideas and details, may have stimuli from any of the four subject areas represented in the digital SAT Suite RW section. Table 3 summarizes the RW taxonomy.

Table 3: Reading and Writing Section Taxonomy in Detail

Content Dimension	Description
Text Complexity	The passages (and pairs of passages) on the Reading and Writing section represent a specified range of text complexities from grades 6–8 through grades 12–14. (Grades 12–14 passages are excluded from appearing on PSAT 8/9.)
Information and Ideas	Students will use comprehension, analysis, and reasoning skills and knowledge as well as what is stated and implied in texts (including in any accompanying informational graphics) to locate, interpret, evaluate, and integrate information and ideas.
Central Ideas and Details	Students will determine the central idea of a text and/or interpret the key details supporting that idea.

Content Dimension	Description
Inferences	Students will draw reasonable inferences based on explicit and/or implicit information and ideas in a text.
Command of Evidence	Students will determine the evidence in a text that best supports a specified claim or point.
Textual	Students will determine the textual evidence (e.g., a fact, detail, or example from a text) that best supports a specified claim or point.
Quantitative	Students will determine the quantitative evidence (i.e., data from an informational graphic) that best supports a specified claim or point.
Craft and Structure	Students will use comprehension, vocabulary, analysis, synthesis, and reasoning skills and knowledge to use and determine the meaning of high-utility words and phrases in context, evaluate texts rhetorically, and make supportable connections between multiple topically related texts.
Words in Context	Students will determine the meaning of a high-utility academic word or phrase in context or use such vocabulary in a contextually appropriate way.
Text Structure and Purpose	Students will analyze the structure of a text or determine the main rhetorical purpose of a text.
Cross-Text Connections	Students will draw reasonable connections between two texts on a related topic.
Expression of Ideas	Students will use revision skills and knowledge to improve the effectiveness of written expression in accordance with specified rhetorical goals.
Rhetorical Synthesis	Students will strategically integrate information and ideas on a topic to form an effective sentence achieving a specified rhetorical aim.
Transitions	Students will determine the most effective transition word or phrase to logically connect information and ideas in a text.
Standard English Conventions	Students will use editing skills and knowledge to make text conform to core conventions of Standard English sentence structure, usage, and punctuation.
Boundaries	Students will edit text to ensure that sentences are conventionally complete.
Form, Structure, and Sense	Students will edit text to conform to conventional usage (e.g., agreement, verb tense/aspect).

The Math Section

The Math section of the digital SAT Suite assessments is designed to measure students' attainment of critical college and career readiness prerequisites in math. The digital SAT Suite Math section focuses on key elements of algebra, advanced math, problem-solving and data analysis, and geometry and (SAT, PSAT/NMSQT, and PSAT 10 only) trigonometry that the best available evidence identifies as necessary for postsecondary readiness and success. Over the course of the Math section of one of the digital SAT Suite assessments, students answer multiple-choice and student-produced response (SPR) questions that measure their fluency with, understanding of, and ability to apply the math concepts, skills, and practices that are most essential for readiness for entry-level postsecondary work.

The construct for the Math section is math achievement relative to core college and career readiness requirements. Although literacy achievement is not directly measured, students are

still required to employ such skills and knowledge to a limited, carefully constrained extent when solving math problems set in context.

In general terms, students who are successful on the Math section will be able to

- analyze, fluently solve, interpret, and create linear equations and inequalities as well as analyze and fluently solve systems of equations using multiple techniques.
- demonstrate attainment of skills and knowledge central for successful progression to more advanced math courses, including analyzing, fluently solving, interpreting, and creating equations, including absolute value, quadratic, exponential, polynomial, rational, radical, and other nonlinear equations, as well as analyzing and fluently solving systems of linear and nonlinear equations in two variables.
- apply quantitative reasoning about ratios, rates, and proportional relationships; understand and apply unit rate; and analyze and interpret one- and two-variable data.
- solve problems that focus on perimeter, area, and volume; angles, triangles, and trigonometry; and circles.

These general suite-level claims are modified to some extent at the individual test program level to account for differences in the age and attainment of the test-taking populations served by each testing program, as elaborated below.

Each of the claims listed above corresponds to one of the four content domains that form the architecture of the Math section. Tables 4 through 6 display the domain structure of the Math section by test program level, beginning with the SAT. The tables include the domains and their associated claims, the skill/knowledge testing points addressed in each domain, and the distribution of operational (scored) questions by domain on each test form.

Table 4: Digital SAT Math Section Content Domains and Operational Question Distribution

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Algebra	Students will interpret, create, use, represent, and solve problems using linear representations, and make connections between different representations of linear relationships, all from high school algebra courses preparatory for the math aligned with college and career readiness expectations.	Linear equations in one variable Linear equations in two variables Linear functions Systems of two linear equations in two variables Linear inequalities in one or two variables	≈35%/ 13–15 questions
Advanced Math	Students will interpret, rewrite, fluently solve, make strategic use of structure, and create absolute value, quadratic, exponential, polynomial, rational, radical, and other nonlinear equations and make connections between different representations of a nonlinear relationship between two variables, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions	≈35%/ 13–15 questions

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Problem-Solving and Data Analysis	Using quantitative reasoning, students will fluently solve problems using percentages, proportional relationships, ratios, rates, and units; analyze and interpret distributions of data; use various representations of data to find relative frequency, probabilities, and conditional probabilities; fit models to data and compare linear and exponential growth; and calculate, compare, and interpret mean, median, range, and standard deviation, understand basic study design, and interpret margin of error, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Ratios, rates, proportional relationships, and units Percentages One-variable data: distributions and measures of center and spread Two-variable data: models and scatterplots Probability and conditional probability Inference from sample statistics and margin of error Evaluating statistical claims: observational studies and experiments	≈15%/ 5–7 questions
Geometry and Trigonometry	Students will solve problems associated with length, area, volume, and scale factors using geometric figures; determine congruence, similarity, and sufficiency using concepts and theorems about vertical angles, triangles, and parallel lines cut by a transversal; solve problems using the Pythagorean theorem, right triangle and unit circle trigonometry, and properties of special right triangles; and use properties and theorems relating to circles to solve problems, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Area and volume Lines, angles, and triangles Right triangles and trigonometry Circles	≈15%/ 5–7 questions

Table 5: Digital PSAT/NMSQT and PSAT 10 Math Section Content Domains and Operational Question Distribution

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Algebra	Students will interpret, create, use, represent, and solve problems using linear representations and make connections between different representations of linear relationships, all from high school algebra courses preparatory for the math aligned with college and career readiness expectations.	Linear equations in one variable Linear equations in two variables Linear functions Systems of two linear equations in two variables Linear inequalities in one or two variables	≈35%/ 13–15 questions
Advanced Math	Students will interpret, rewrite, fluently solve, make strategic use of structure, and create absolute value, quadratic, exponential, polynomial, rational, radical, and other nonlinear equations and make connections between different representations of a nonlinear relationship between two variables, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions	≈32.5%/ 12–14 questions
Problem-Solving and Data Analysis	Using quantitative reasoning, students will fluently solve problems using percentages, proportional relationships, ratios, rates, and units; analyze and interpret distributions of data; use various representations of data to find relative frequency, probabilities, and conditional probabilities; fit models to data and compare linear and exponential growth; and calculate, compare, and interpret mean, median, and range and compare distributions with the same and different standard deviation, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Ratios, rates, proportional relationships, and units Percentages One-variable data: distributions and measures of center and spread Two-variable data: models and scatterplots Probability and conditional probability Inference from sample statistics	≈20%/ 7–9 questions
Geometry and Trigonometry	Students will solve problems associated with length, area, volume, and scale factors using geometric figures; determine congruence, similarity, and sufficiency using concepts and theorems about vertical angles, triangles, and parallel lines cut by a transversal; and solve problems using the Pythagorean theorem and right triangle trigonometry, all from high school courses preparatory for the math aligned with college and career readiness expectations.	Area and volume Lines, angles, and triangles Right triangles and right triangle trigonometry	≈12.5%/ 4–6 questions

Table 6: Digital PSAT 8/9 Math Section Content Domains and Operational Question Distribution

Content Domain	Domain Description (Claim)	Skill/Knowledge Testing Points	Operational Question Distribution
Algebra	Students will interpret, create, use, represent, and solve problems using linear representations and make connections between different representations of linear relationships, all from middle school/junior high school and first-year algebra courses preparatory for the math aligned with college and career readiness expectations.	Linear equations in one variable Linear equations in two variables Linear functions Systems of two linear equations in two variables Linear inequalities in one or two variables	≈42.5%/ 16–18 questions
Advanced Math	Students will rewrite, fluently solve, and make strategic use of structure, absolute value, quadratic, exponential, polynomial, and other nonlinear equations and make connections between different representations of a nonlinear relationship between two variables, all from middle school/junior high school and first-year algebra courses preparatory for the math aligned with college and career readiness expectations.	Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions	≈20%/ 7–9 questions
Problem-Solving and Data Analysis	Using quantitative reasoning, students will fluently solve problems using percentages, proportional relationships, ratios, rates, and units; analyze and interpret distributions of data; use various representations of data to find relative frequency, probabilities, and conditional probabilities; fit models to data; and calculate, compare, and interpret mean, median, and range, all from middle school/junior high school and first-year algebra courses preparatory for the math aligned with college and career readiness expectations.	Ratios, rates, proportional relationships, and units Percentages One-variable data: distributions and measures of center and spread Two-variable data: models and scatterplots Probability and conditional probability	≈25%/ 9–11 questions
Geometry	Students will solve problems associated with length, area, volume, and scale factors using geometric figures; apply theorems such as triangle sum; and solve problems using the Pythagorean theorem, all from middle school/junior high school and first-year algebra courses preparatory for the math aligned with college and career readiness expectations.	Area and volume Lines, angles, and triangles, including right triangles	≈12.5%/ 4–6 questions

Two question formats are used on the Math section. Approximately 75 percent of the questions are in the four-option multiple-choice (MC) format, for which students are asked to select the single best response from among the four provided answer options. The remaining approximately 25 percent of questions are in the student-produced response (SPR) format, for which students are asked to generate and enter their own responses; while these questions may have more than one possible correct response, students are directed to supply only one answer.

The MC and SPR questions will measure skills and knowledge across the four content dimensions of the tests as shown in table 7.

Table 7: Digital SAT Suite Math Section: Distribution of MC and SPR Question Formats across Content Domains

Digital SAT Suite Testing Program	Question Format	Algebra	Advanced Math	Problem-Solving and Data Analysis	Geometry and Trigonometry (SAT, PSAT/NMSQT, PSAT 10)/Geometry (PSAT 8/9)	Total
SAT	MC	10–11	10–11	4–5	4–5	28–32
	SPR	3–4	3–4	1–2	1–2	8–12
PSAT/NMSQT/10	MC	10–11	10–11	5–6	3–4	28–32
	SPR	3–4	2–3	2–3	1–2	8–12
PSAT 8/9	MC	14–15	5–6	6–7	3–4	28–32
	SPR	2–3	2–3	3–4	1–2	8–12

Detailed views of the Math taxonomy are presented in **Appendix A: Math Section Taxonomy in Detail**, including the skill/knowledge testing points in each of four domains: Algebra, Advanced Math, Problem-Solving and Data Analysis, and Geometry (and Trigonometry).

Section 3: Evidentiary Foundations

In line with its primary purpose, the digital SAT Suite of Assessments is founded on the best available evidence concerning essential college and career readiness prerequisites. When designing the digital suite, College Board drew on three main sources of such evidence.

- Research conducted or planned on the design of the digital SAT Suite itself, which includes an extensive series of one-time and ongoing studies intended to gather evidence in support of design features of the suite.
- Construct and content validity evidence, which affirms the choices College Board has made in determining what skills and knowledge should be assessed by the digital SAT Suite.
- Subject area evidence, which confirms important content emphases in English language arts/literacy and math assessment on the digital SAT Suite.

This section briefly summarizes the process used to examine and the findings from each source. A full overview of the evidence, including extensive research citations, may be found in chapter 5 of the ***Assessment Framework for the Digital SAT Suite***.

Research on the digital SAT Suite. The process of conducting research undergirding key design decisions for the digital SAT Suite continues College Board's tradition of exhaustively examining every aspect of its tests to ensure that they meet or exceed the highest standards for large-scale standardized assessment. These studies, both one-time and ongoing, assess the validity, reliability, and fairness of the digital SAT Suite tests from both psychometric and content standpoints and include test section piloting; pretesting of test questions on samples of the suite's test-taking populations; student postexperience surveys and focus groups; timing, SAT concordance, vertical scaling, and predictive and concurrent validity studies; independent state standards alignment studies; curriculum surveys; and cognitive labs. Findings from these various studies have, to date, supported the design decisions behind the digital SAT Suite and served to confirm that the tests are valid, reliable, and fair measures of students' literacy and math achievement in accordance with college and career readiness outcomes.

Construct and content validity evidence. When evaluating what content to measure on the digital SAT Suite tests, College Board drew on several important sources of information. The first such source was what had been assessed on the paper-based SAT Suite, as those tests were themselves firmly based on evidence regarding essential college and career readiness requirements. Curriculum survey data collected from a nationally representative sample of

postsecondary educators in various subject areas were also extensively consulted to affirm and refine content selection. Finally, College Board internally examined the alignment between the digital SAT Suite tests' specifications and states' college and career readiness standards to ensure broad and extensive conformity to those expectations, even as the standards vary to some extent from state to state and given that the digital suite is not intended to measure any one set of such standards. This internal alignment study will be supplemented by independent, third-party alignment studies to be conducted in 2022 for the SAT and in 2023 for the PSAT-related assessments. This work, to date, has confirmed that the digital SAT Suite tests measure the important constructs of literacy and math achievement and sample a robust range of skills and knowledge elements closely associated with these constructs.

Subject area evidence. College Board has also continued to document and disseminate findings from high-quality third-party research in support of assessment emphases in the digital SAT Suite. For the Reading and Writing section, these emphases include sustained attention to text complexity; close reading and command of evidence, both textual and quantitative; inference making; high-utility academic (tier two) vocabulary; core Standard English sentence structure, usage, and punctuation conventions; and the literacy demands of a range of academic disciplines (literature, history/social studies, the humanities, and science). In Math, subject area research has strongly influenced the selection of skill/knowledge testing points and the manner in which these points are assessed in the content domains of algebra, advanced math, problem-solving and data analysis, and geometry and trigonometry.

Appendix A: Math Section Taxonomy in Detail

Table 8: Math Section Taxonomy in Detail: Algebra

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Linear equations in one variable	1. Create and use linear equations in one variable to solve problems in a variety of contexts. 2. Identify or create a linear equation in one variable that represents a context. 3. For a linear equation in one variable, interpret a constant, variable, factor, term, or the solution in a context. 4. Solve a linear equation in one variable, making strategic use of algebraic structure. 5. For a linear equation in one variable, determine the conditions under which the equation has no solution, a unique solution, or infinitely many solutions. 6. Fluently solve a linear equation in one variable.	1. Create and use linear equations in one variable to solve problems in a variety of contexts. 2. Identify or create a linear equation in one variable that represents a context. 3. For a linear equation in one variable, interpret a constant, variable, factor, term, or the solution in a context. 4. Solve a linear equation in one variable, making strategic use of algebraic structure. 5. For a linear equation in one variable, determine the conditions under which the equation has no solution, a unique solution, or infinitely many solutions. 6. Fluently solve a linear equation in one variable.	1. Create and use linear equations in one variable to solve problems in a variety of contexts. 2. Identify or create a linear equation in one variable that represents a context. 3. For a linear equation in one variable, interpret a constant, variable, factor, term, or the solution in a context. 4. Solve a linear equation in one variable, making strategic use of algebraic structure. 5. Fluently solve a linear equation in one variable.
Linear functions	1. Create and use linear functions to solve problems in a variety of contexts. 2. Identify or create a linear function to model a relationship between two quantities. 3. For a linear function that represents a context, interpret the meaning of an input/output pair,	1. Create and use linear functions to solve problems in a variety of contexts. 2. Identify or create a linear function to model a relationship between two quantities. 3. For a linear function that represents a context, interpret the meaning of an input/output pair,	1. Create and use linear functions to solve problems in a variety of contexts. 2. Identify or create a linear function to model a relationship between two quantities. 3. For a linear function that represents a context, interpret the meaning of an input/output pair,

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
	constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear function in a context. 5. Make connections between a table, an algebraic representation, or a graph of a linear function not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear function in context.	constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear function in a context. 5. Make connections between a table, an algebraic representation, or a graph of a linear function not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear function in context.	constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear function in a context. 5. Make connections between a table, an algebraic representation, or a graph of a linear function not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear function in context.
Linear functions *(continued)*	7. For a linear function that represents a context, given an input value, find and interpret the output value using the given representation, or given an output value, find and interpret the input value using the given representation, if it exists. 8. Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change. 9. Evaluate a linear function given an input value, or find the input value for a corresponding output.	7. For a linear function that represents a context, given an input value, find and interpret the output value using the given representation, or given an output value, find and interpret the input value using the given representation, if it exists. 8. Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change. 9. Evaluate a linear function given an input value, or find the input value for a corresponding output.	7. For a linear function that represents a context, given an input value, find and interpret the output value using the given representation, or given an output value, find and interpret the input value using the given representation, if it exists. 8. Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change. 9. Evaluate a linear function given an input value, or find the input value for a corresponding output.
Linear equations in two variables	1. Create and use a linear equation in two variables to solve problems in a variety of contexts. 2. Identify or create a linear equation in two variables to model a constraint or condition on two quantities. 3. For a linear equation in two variables that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear equation in the form $Ax + By = C$ in a context. 5. Make connections between:	1. Create and use a linear equation in two variables to solve problems in a variety of contexts. 2. Identify or create a linear equation in two variables to model a constraint or condition on two quantities. 3. For a linear equation in two variables that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear equation in the form $Ax + By = C$ in a context. 5. Make connections between:	1. Create and use a linear equation in two variables to solve problems in a variety of contexts. 2. Identify or create a linear equation in two variables to model a constraint or condition on two quantities. 3. For a linear equation in two variables that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Interpret the graph of a linear equation in the form $Ax + By = C$ in a context. 5. Make connections between:

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
	a. an algebraic representation and a graph of a linear equation in two variables not in context. b. a table and an algebraic representation or between a table and a graph of a linear equation in two variables not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear equation in two variables in a context. 7. For a linear equation in two variables that represents a context, given a value of one quantity in the relationship, find a value of the other, if it exists.	a. an algebraic representation and a graph of a linear equation in two variables not in context. b. a table and an algebraic representation or between a table and a graph of a linear equation in two variables not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear equation in two variables in a context. 7. For a linear equation in two variables that represents a context, given a value of one quantity in the relationship, find a value of the other, if it exists.	a. an algebraic representation and a graph of a linear equation in two variables not in context. b. a table and an algebraic representation or between a table and a graph of a linear equation in two variables not in context. 6. Make connections between a table, an algebraic representation, or a graph of a linear equation in two variables in a context. 7. For a linear equation in two variables that represents a context, given a value of one quantity in the relationship, find a value of the other, if it exists.
Linear equations in two variables *(continued)*	8. Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.	8. Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.	8. Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.
Systems of two linear equations in two variables	1. Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. 2. Identify or create a system of linear equations in two variables to model constraints or conditions on two quantities. 3. For a system of linear equations in two variables, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Solve a system of two linear equations in two variables, making strategic use of algebraic structure. 5. For a system of linear equations in two variables, determine the conditions under which the system has no solution, a unique solution, or infinitely many solutions. 6. Make connections between an algebraic representation and a graph of a system of linear equations in two variables not in context.	1. Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. 2. Identify or create a system of linear equations in two variables to model constraints or conditions on two quantities. 3. For a system of linear equations in two variables, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. Solve a system of two linear equations in two variables, making strategic use of algebraic structure. 5. For a system of linear equations in two variables, determine the conditions under which the system has no solution, a unique solution, or infinitely many solutions. 6. Make connections between an algebraic representation and a graph of a system of linear equations in two variables not in context.	1. Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. 2. Identify or create a system of linear equations in two variables to model constraints or conditions on two quantities. 3. Solve a system of two linear equations in two variables, making strategic use of algebraic structure. 4. Make connections between an algebraic representation and a graph of a system of linear equations in two variables not in context. 5. Make connections between an algebraic representation and a graph of a system of linear equations in two variables in a context. 6. Fluently solve a system of linear equations in two variables.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
	7. Make connections between an algebraic representation and a graph of a system of linear equations in two variables in a context. 8. Fluently solve a system of linear equations in two variables.	7. Make connections between an algebraic representation and a graph of a system of linear equations in two variables in a context. 8. Fluently solve a system of linear equations in two variables.	
Linear inequalities in one or two variables	1. Create and use linear inequalities in one or two variables to solve problems in a variety of contexts. 2. Identify or create linear inequalities in one or two variables to model constraints or conditions on two quantities.	1. Create and use linear inequalities in one or two variables to solve problems in a variety of contexts. 2. Identify or create linear inequalities in one or two variables to model constraints or conditions on two quantities.	1. Create and use linear inequalities in one or two variables to solve problems in a variety of contexts. 2. Identify or create linear inequalities in one or two variables to model constraints or conditions on two quantities.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Linear inequalities in one or two variables *(continued)*	3. For linear inequalities in one or two variables, interpret a constant, variable, factor, term, or solution, including situations where seeing structure provides an advantage. 4. Given a linear inequality or system of linear inequalities, interpret a point in the *xy*-plane in terms of the solution set. 5. Make connections between tabular, algebraic, and graphical representations of linear inequalities in one or two variables by deriving one from the other.	3. For linear inequalities in one or two variables, interpret a constant, variable, factor, term, or solution, including situations where seeing structure provides an advantage. 4. Given a linear inequality or system of linear inequalities, interpret a point in the *xy*-plane in terms of the solution set. 5. Make connections between tabular, algebraic, and graphical representations of linear inequalities in one or two variables by deriving one from the other.	3. For linear inequalities in one or two variables, interpret a constant, variable, factor, term, or solution, including situations where seeing structure provides an advantage. 4. Given a linear inequality or system of linear inequalities, interpret a point in the *xy*-plane in terms of the solution set.

Table 9: Math Section Tax onomy in Detail: Advanced Math

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Equivalent expressions	1. Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions: a. by factoring polynomials limited to finding a common factor, rewriting binomials that represent a difference of two squares, and rewriting trinomials as the product of two binomials. b. including rewriting simple rational expressions, rewriting expressions with rational exponents in radical form, and factoring polynomials not included in 1a. 2. Fluently add, subtract, and multiply polynomials.	1. Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions by factoring polynomials limited to finding a common factor, rewriting binomials that represent a difference of two squares, and rewriting trinomials as the product of two binomials. 2. Fluently add, subtract, and multiply polynomials.	1. Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions by factoring polynomials limited to finding a common factor, rewriting binomials that represent a difference of two squares, and rewriting trinomials as the product of two binomials. 2. Fluently add, subtract, and multiply polynomials.
Nonlinear equations in one variable and systems of equations in two variables	1. Make strategic use of algebraic structure, the properties of operations, and/or reasoning about equality to solve: a. quadratic equations in one variable presented in a wide variety of forms. b. linear absolute value equations in one variable or simple rational and radical equations in one variable. c. polynomial equations in one variable that are written in factored form. 2. Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to solve systems of linear and nonlinear equations in two variables. 3. Determine the conditions under which a quadratic equation has no real solutions, one real solution, or two real solutions. 4. Relate the solutions of a system of a linear and a nonlinear equation in two variables to the graphs of the equations in the system.	1. Make strategic use of algebraic structure, the properties of operations, and/or reasoning about equality to solve: a. quadratic equations in one variable presented in a wide variety of forms. b. linear absolute value equations in one variable or simple rational and radical equations in one variable. 2. Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to solve systems of linear and nonlinear equations in two variables. 3. Determine the conditions under which a quadratic equation has no real solutions, one real solution, or two real solutions. 4. Relate the solutions of a system of a linear and a nonlinear equation in two variables to the graphs of the equations in the system.	1. Make strategic use of algebraic structure, the properties of operations, and/or reasoning about equality to solve quadratic equations in one variable presented in a wide variety of forms. 2. Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to solve systems of linear and nonlinear equations in two variables. 3. Relate the solutions of a system of a linear and a nonlinear equation in two variables to the graphs of the equations in the system. 4. Given an equation or formula in two or more variables, view it as an equation in a single variable of interest where the other variables are parameters, and solve for the variable of interest.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Nonlinear equations in one variable and systems of equations in two variables *(continued)*	5. Given an equation or formula in two or more variables, view it as an equation in a single variable of interest where the other variables are parameters, and solve for the variable of interest. 6. Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form, where using the quadratic formula or completing the square is the most efficient method for solving the equation.	5. Given an equation or formula in two or more variables, view it as an equation in a single variable of interest where the other variables are parameters, and solve for the variable of interest. 6. Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form, where using the quadratic formula or completing the square is the most efficient method for solving the equation.	5. Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form, where using the quadratic formula or completing the square is the most efficient method for solving the equation.
Nonlinear functions	1. Create and use quadratic or exponential functions to solve problems in a variety of contexts. 2. Identify or create an appropriate quadratic or exponential function to model a relationship between quantities. 3. For a quadratic or exponential function that represents a context: a. interpret the meaning of an input/output pair including an intercept or initial value, including situations where seeing structure provides an advantage. b. interpret the meaning of a constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. For a quadratic or exponential function in a context: a. interpret a point on the graph. b. interpret parts of the graph (other than a point or intercept).	1. Create and use quadratic or exponential functions to solve problems in a variety of contexts. 2. Identify or create an appropriate quadratic or exponential function to model a relationship between quantities. 3. For a quadratic or exponential function that represents a context: a. interpret the meaning of an input/output pair including an intercept or initial value, including situations where seeing structure provides an advantage. b. interpret the meaning of a constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. 4. For a quadratic or exponential function in a context: a. interpret a point on the graph. b. interpret parts of the graph (other than a point or intercept).	1. For a quadratic or exponential function that represents a context, interpret the meaning of an input/output pair including an intercept or initial value, including situations where seeing structure provides an advantage. 2. For a quadratic or exponential function in a context, interpret a point on the graph. 3. Make connections between a table, an algebraic representation, or a graph of a quadratic or exponential function that does not involve a transformation, not in context. 4. Make connections between a table, an algebraic representation, or a graph of a quadratic or exponential function that does not involve a transformation, in a context.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Nonlinear functions *(continued)*	5. Make connections between a table, an algebraic representation, or a graph of a: a. quadratic or exponential function that does not involve a transformation, not in context. b. polynomial function, simple rational function, or quadratic or exponential function that involves a transformation, not in context. 6. Make connections between a table, an algebraic representation, or a graph of a: a. quadratic or exponential function that does not involve a transformation, in a context. b. polynomial function, simple rational function, or other nonlinear function in a context, or a quadratic or exponential function that involves a transformation in a context. 7. Determine the most suitable form of the expression representing the output of the function to display key features for: a. a quadratic function. b. an exponential function. 8. Understand and use the fact that for the graph of $y = f(x)$, the solutions to $f(x) = 0$ correspond to x-intercepts of the graph and $f(0)$ corresponds to the y-intercept of the graph; make connections between the input/output pairs and points on a graph; interpret this information in a context. 9. Use function notation to represent and interpret input/output pairs: a. evaluate a nonlinear function given an input value; or, for a quadratic function, find the input value for a corresponding output. b. for exponential, polynomial, radical, and rational functions, find the input value for a corresponding output.	5. Make connections between a table, an algebraic representation, or a graph of a: a. quadratic or exponential function that does not involve a transformation, not in context. b. polynomial function, simple rational function, or quadratic or exponential function that involves a transformation, not in context. 6. Make connections between a table, an algebraic representation, or a graph of a: a. quadratic or exponential function that does not involve a transformation, in a context. b. polynomial function, simple rational function, or other nonlinear function in a context, or a quadratic or exponential function that involves a transformation in a context. 7. Determine the most suitable form of the expression representing the output of the function to display key features for: a. a quadratic function. b. an exponential function. 8. Use function notation to represent and interpret input/output pairs: a. evaluate a nonlinear function given an input value; or, for a quadratic function, find the input value for a corresponding output. b. for exponential, polynomial, radical, and rational functions, find the input value for a corresponding output.	5. Use function notation to represent and interpret input/output pairs. Evaluate a nonlinear function given an input value; or, for a quadratic function, find the input value for a corresponding output.

Table 10: Math Section Taxonomy in Detail: Problem -Solving and Data Analysis

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Ratios, rates, proportional relationships, and units	1. Apply proportional relationships, ratios, and rates in a wide variety of contexts. Examples include, but are not limited to, scale drawings and problems in the natural and social sciences. 2. Solve problems involving derived units, including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer). 3. Solve problems involving: a. a one-step unit conversion. b. a multistep or multidimensional unit conversion. 4. Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then the other also changes by the same scale factor.	1. Apply proportional relationships, ratios, and rates in a wide variety of contexts. Examples include, but are not limited to, scale drawings and problems in the natural and social sciences. 2. Solve problems involving derived units, including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer). 3. Solve problems involving: a. a one-step unit conversion. b. a multistep or multidimensional unit conversion. 4. Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then the other also changes by the same scale factor.	1. Apply proportional relationships, ratios, and rates in a wide variety of contexts. Examples include, but are not limited to, scale drawings and problems in the natural and social sciences. 2. Solve problems involving derived units, including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer). 3. Solve problems involving: a. a one-step unit conversion. b. a multistep or multidimensional unit conversion. 4. Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then the other also changes by the same scale factor.
Percentages	1. Use percentages to solve problems in a variety of contexts: a. including, but not limited to, discounts, interest, taxes, and tips. b. including those that involve percent increases and decreases for many different quantities. 2. Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.	1. Use percentages to solve problems in a variety of contexts: a. including, but not limited to, discounts, interest, taxes, and tips. b. including those that involve percent increases and decreases for many different quantities. 2. Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.	1. Use percentages to solve problems in a variety of contexts: a. including, but not limited to, discounts, interest, taxes, and tips. b. including those that involve percent increases and decreases for many different quantities. 2. Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
One-variable data: Distributions and measures of center and spread	1. Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and box plots. 2. For quantitative variables, calculate, compare, and interpret mean, median, and range. 3. Compare distributions using measures of center and spread, including: a. distributions with different means and the same standard deviations. b. distributions with different standard deviations. 4. Understand and describe the effect of outliers on mean and median.	1. Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and box plots. 2. For quantitative variables, calculate, compare, and interpret mean, median, and range. 3. Compare distributions using measures of center and spread, including: a. distributions with different means and the same standard deviations. b. distributions with different standard deviations. 4. Understand and describe the effect of outliers on mean and median.	1. Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and box plots. 2. For quantitative variables, calculate, compare, and interpret mean, median, and range. 3. Compare distributions using measures of center and spread, including distributions with different means and the same standard deviations. 4. Understand and describe the effect of outliers on mean and median.
Two-variable data: Models and scatterplots	1. Analyze and interpret data represented in a scatterplot, but do not make predictions. 2. Analyze and interpret data represented in a scatterplot to make predictions. 3. Fit linear models to data represented in a scatterplot. 4. Fit quadratic and exponential models to data represented in a scatterplot. 5. Given a relationship between two quantities, read and interpret graphs modeling the relationship. 6. Compare linear and exponential growth.	1. Analyze and interpret data represented in a scatterplot, but do not make predictions. 2. Analyze and interpret data represented in a scatterplot to make predictions. 3. Fit linear models to data represented in a scatterplot. 4. Fit quadratic and exponential models to data represented in a scatterplot. 5. Given a relationship between two quantities, read and interpret graphs modeling the relationship. 6. Compare linear and exponential growth.	1. Analyze and interpret data represented in a scatterplot, but do not make predictions. 2. Fit linear models to data represented in a scatterplot. 3. Given a relationship between two quantities, read and interpret graphs modeling the relationship.
Probability and conditional probability	Use one- and two-way tables, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. 1. Calculate, express, or interpret the probability or conditional probability of an event using a data display showing frequencies for a single variable, a two-way table, an area model, or a description of a situation. Infrequently, given a probability, determine an unknown number in a data display showing frequencies for a single variable, a two-way table, or a description of a situation, including using a probability to determine the frequency of an event.	Use one- and two-way tables, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. 1. Calculate, express, or interpret the probability or conditional probability of an event using a data display showing frequencies for a single variable, a two-way table, an area model, or a description of a situation. Infrequently, given a probability, determine an unknown number in a data display showing frequencies for a single variable, a two-way table, or a description of a situation, including using a probability to determine the frequency of an event.	Use one- and two-way tables, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. 1. Calculate, express, or interpret the probability or conditional probability of an event using a data display showing frequencies for a single variable, a two-way table, an area model, or a description of a situation. Infrequently, given a probability, determine an unknown number in a data display showing frequencies for a single variable, a two-way table, or a description of a situation, including using a probability to determine the frequency of an event.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Inference from sample statistics and margin of error	1. Use sample mean and sample proportion to estimate population mean and population proportion. 2. Interpret margin of error. Understand that a larger sample size generally leads to a smaller margin of error.	1. Use sample mean and sample proportion to estimate population mean and population proportion.	
Evaluating statistical claims: Observational studies and experiments	1. With random samples, identify or describe which population the results can be extended to. Given a description of a study with or without random assignment, determine whether there is evidence for a causal relationship. 2. Understand why random assignment provides evidence for a causal relationship in an experimental study. 3. Understand issues related to sampling methods and why a result can be extended only to the population from which the sample was selected.		

Table 11: Math Section Taxonomy in Detail: Geometry (and Trigonometry)

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Area and volume	1. Solve real-world and mathematical problems about the: a. area or perimeter of a geometric figure or an object that can be modeled by a geometric figure using given information. b. surface area or volume of a geometric figure or an object that can be modeled by a geometric figure using given information such as length, area, surface area, or volume. 2. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, changes all areas by a factor of k^2, and changes all volumes by a factor of k^3 . 3. Demonstrate procedural fluency by selecting the correct: a. area formula and correctly calculating a specified value. b. surface area or volume formula and correctly calculating a specified value.	1. Solve real-world and mathematical problems about the: a. area or perimeter of a geometric figure or an object that can be modeled by a geometric figure using given information. b. surface area or volume of a geometric figure or an object that can be modeled by a geometric figure using given information such as length, area, surface area, or volume. 2. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, changes all areas by a factor of k^2, and changes all volumes by a factor of k^3. 3. Demonstrate procedural fluency by selecting the correct: a. area formula and correctly calculating a specified value. b. surface area or volume formula and correctly calculating a specified value.	1. Solve real-world and mathematical problems about the: a. area or perimeter of a geometric figure or an object that can be modeled by a geometric figure using given information. b. surface area or volume of a geometric figure or an object that can be modeled by a geometric figure using given information such as length, area, surface area, or volume. 2. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, changes all areas by a factor of k^2, and changes all volumes by a factor of k^3. 3. Demonstrate procedural fluency by selecting the correct: a. area formula and correctly calculating a specified value. b. surface area or volume formula and correctly calculating a specified value.
Lines, angles, and triangles	1. Use concepts and theorems relating to congruence and similarity of triangles to solve problems. 2. Determine which statements may be required to prove certain relationships or to satisfy a given theorem. 3. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, but angle measures remain unchanged. 4. Know and directly apply relevant theorems such as the: a. triangle angle sum theorem. b. vertical angle theorem and the relationship of angles formed when a transversal cuts parallel lines.	1. Use concepts and theorems relating to congruence and similarity of triangles to solve problems. 2. Determine which statements may be required to prove certain relationships or to satisfy a given theorem. 3. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, but angle measures remain unchanged. 4. Know and directly apply relevant theorems such as the: a. triangle angle sum theorem. b. vertical angle theorem and the relationship of angles formed when a transversal cuts parallel lines.	1. Know and directly apply the triangle angle sum theorem.

Content Dimension	SAT Description	PSAT/NMSQT and PSAT 10 Description	PSAT 8/9 Description
Right triangles and trigonometry	1. Solve problems in a variety of contexts using: a. the Pythagorean theorem. b. properties of special right triangles. c. right triangle trigonometry. 2. Use similarity to calculate values of sine, cosine, and tangent. 3. Solve problems using the relationship between sine and cosine of complementary angles.	1. Solve problems in a variety of contexts using: a. the Pythagorean theorem. b. properties of special right triangles. c. right triangle trigonometry.	1. Solve problems in a variety of contexts using the Pythagorean theorem.
Circles	1. Use definitions, properties, and theorems relating to circles and parts of circles such as radii, diameters, tangents, angles, arc lengths, and sector areas to solve problems. 2. Solve problems using either radian measure or trigonometric ratios in the unit circle. 3. Create an equation to represent a circle in the *xy*-plane. 4. Describe how a change to the equation representing a circle affects the graph of the circle in the *xy*-plane or how a change to the graph of a circle affects the equation that represents the circle. 5. Understand that the ordered pairs that satisfy an equation of the form $(x-h)^2+(y-k)^2=r^2$ form a circle when plotted in the *xy*-plane. 6. Convert between angle measures in degrees and radians. 7. Complete the square in an equation representing a circle to determine properties of the circle when it is graphed in the *xy*-plane and use the distance formula in problems related to circles.		

Appendix B: Alignments of ELA Standards to Digital SAT Suite

The following tables detail the Colorado Academic Standards–digital SAT Suite alignments using the standards as the organizing principle.

Table 12: Grades 11–12 Aligned to Digital SAT

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.3.GLE.1.EO.a	Use Key Ideas and Details to: i. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. (CCSS: RL.11-12.1) ii. Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text. (CCSS: RL.11-12.2) iii. Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (for example: where a story is set, how the action is ordered, how the characters are introduced and developed). (CCSS: RL.11-12.3)	✓		✓		✓					
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.3.GLE.1.EO.b	b. Use Craft and Structure to: i. Determine the meaning of words and phrases as they are used in the text,	✓			✓	✓					

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.) (CCSS: RL.11-12.4) ii. Analyze how an author's choices concerning how to structure specific parts of a text (for example: the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact. (CCSS: RL.11-12.5) iii. Analyze a case in which grasping a point of view requires distinguishing what is directly stated in a text from what is really meant (for example: satire, sarcasm, irony, or understatement). (CCSS: RL.11-12.6)									
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.3.GLE.1.EO.c	Use Integration of Knowledge and Ideas to: i. By the end of 12th grade, analyze multiple interpretations of a story, drama, or poem (for example: recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (for example: a play by Shakespeare and/or a play by an American dramatist.) (adapted from CCSS: RL.11-12.7) ii. By the end of 12th grade, demonstrate knowledge of foundational works of American literature, including how two or more texts from the same period treat										

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		similar themes or topics. (adapted from CCSS: RL.11-12.9)										
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.3.GLE.1.EO.d	d. Use Range of Reading and Complexity of Text to: i. By the end of grade 11, read and comprehend literature, including stories, dramas, and poems, in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. (CCSS: RL.11-12.10) ii. By the end of grade 12, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 11-CCR text complexity band independently and proficiently. (CCSS RL.11-12.10)	✓		✓	✓	✓					
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.4.GLE.2.EO.a	Use Key Ideas and Details to: i. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. (CCSS: RI.11-12.1) ii. Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text. (CCSS: RI.11-12.2) iii. Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text. (CCSS: RI.11-12.3) iv. Designate a purpose for reading expository texts and use new learning to	✓	✓	✓		✓					

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		complete a specific task (such as convince an audience, shape a personal opinion or decision, or perform an activity). v. Predict the impact an informational text will have on an audience and justify the prediction.										
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.4.GLE.2.EO.b	Use Craft and Structure to: i. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (for example: how Madison defines "faction" in Federalist No. 10). (CCSS: RI.11-12.4) ii. Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging. (CCSS: RI.11-12.5) iii. Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness or beauty of the text. (CCSS: RI.11-12.6)	✓	✓		✓	✓	✓				
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.4.GLE.2.EO.c	Use Integration of Knowledge and Ideas to: i. Integrate and evaluate multiple sources of information presented in different media or formats (for example: visually, quantitatively) as well as in words in order to address a question or solve a problem. (CCSS: RI.11-12.7) ii. Delineate and evaluate the reasoning in			✓							

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (for example: in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (for example: The Federalist Papers, presidential addresses) by the end of 12th grade. (adapted from CCSS: RI.11-12.8) iii. Analyze 17th-, 18th-, and 19th-century foundational U.S. documents of historical and literary significance (for example: The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features by the end of 12th grade. (adapted from CCSS: RI.11-12.9)									
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.4.GLE.2.EO.d	Use Range of Reading and Complexity of Text to: i. By the end of grade 11, read and comprehend literary nonfiction in the grades 11-CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. (CCSS: RI.11-12.10) ii. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11-CCR text complexity band independently and proficiently.	✓	✓	✓	✓	✓	✓				
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.5.GLE.3.EO.a	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. (CCSS: L.11-12.4)	✓	✓		✓						

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		i. Use context (for example: the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. (CCSS: L.11-12.4a) ii. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (for example: conceive, conception, conceivable). (CCSS: L.11-12.4b) iii. Consult general and specialized reference materials (for example: dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. (CCSS: L.11-12.4c) iv. Verify the preliminary determination of the meaning of a word or phrase (for example: by checking the inferred meaning in context or in a dictionary). (CCSS: L.11-12.4d)									
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.5.GLE.3.EO.b	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. (CCSS: L.11-12.5) i. Interpret figures of speech (for example: hyperbole, paradox) in context and analyze their role in the text. (CCSS: L.11-12.5a) ii. Analyze nuances in the meaning of words with similar denotations. (CCSS: L.11-12.5b)	✓	✓		✓			✓	✓		
Standard 2. Reading for All Purposes	RWC20.GR.1112.S.5.GLE.3.EO.c	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing,	✓	✓		✓			✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. (CCSS: L.11–12.6)										
Standard 3. Writing and Composition	RWC20.GR.1112.S.6.GLE.1.EO.a	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. (CCSS W.11-12.1) i. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. (CCSS W.11-12.1a) ii. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. (CCSS W.11-12.1b) iii. Use words, phrases, clauses, as well as varied syntax to link the major sections of the text, to create cohesion, and to clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. (adapted from CCSS W.11-12.1c) iv. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. (CCSS W.11-12.1d) v. Provide a concluding statement or							✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		section that follows from and supports the argument presented. (CCSS W.11-12.1e)										
Standard 3. Writing and Composition	RWC20.GR.1112.S.7.GLE.2.EO.a	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. (CCSS W.11-12.2) i. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (for example: headings), graphics (for example: figures, tables), and multimedia when useful to aiding comprehension. (CCSS W.11-12.2a) ii. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. (CCSS W.11-12.2b) iii. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. (CCSS W.11-12.2c) iv. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. (CCSS W.11-12.2d) v. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in							✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		which they are writing. (CCSS W.11-12.2e) vi. Provide a concluding statement or section that follows from and supports the information or explanation presented (for example: articulating implications or the significance of the topic). (CCSS W.11-12.2f)										
Standard 3. Writing and Composition	RWC20.GR.1112.S.8.GLE.3.EO.a.i	Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. (CCSS W.11-12.3) i. Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events. (CCSS W.11-12.3a) ii. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. (CCSS W.11-12.3b) iii. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (for example, a sense of mystery, suspense, growth, or resolution). (CCSS W.11-12.3c) iv. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters. (CCSS W.11-12.3d) v. Provide a conclusion that follows from										

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		and reflects on what is experienced, observed, or resolved over the course of the narrative. (CCSS W.11-12.3e) vi. Select and use stylistic devices to craft engaging and effective text.										
Standard 3. Writing and Composition	RWC20.GR.1112.S.9.GLE.4.EO.a	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. (CCSS: L.11-12.1) i. Apply the understanding that usage is a matter of convention, can change over time, and is sometimes contested. (CCSS: L.11-12.1a) ii. Resolve issues of complex or contested usage, consulting references (for example: Merriam-Webster's Dictionary of English Usage, Garner's Modern American Usage) as needed. (CCSS: L.11-12.1b)									✓	✓
Standard 3. Writing and Composition	RWC20.GR.1112.S.9.GLE.4.EO.b	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. (CCSS: L.11-12.2) i. Observe hyphenation conventions. (CCSS: L.11-12.2a) ii. Correctly spell frequently used words and consult reference materials (for example: dictionaries, both print and digital, spell check, and/or trusted peers and/or adults) to determine the spelling of less frequent vocabulary. (adapted from CCSS: L.11-12.2b)									✓	✓
Standard 3. Writing and Composition	RWC20.GR.1112.S.9.GLE.4.EO.c	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. (CCSS.ELA-Literacy.L.11-12.3)	✓	✓		✓			✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		i. Vary syntax for effect, consulting references for guidance as needed; apply an understanding of syntax to the study of complex texts when reading. (adapted from CCSS: L.11-12.3a)										
Standard 3. Writing and Composition	RWC20.GR.1112.S.9.GLE.4.EO.d	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in expectations 1-2 above.) (CCSS: W.11–12.4)							✓	✓		
Standard 3. Writing and Composition	RWC20.GR.1112.S.9.GLE.4.EO.e	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (CCSS: W.11–12.5)							✓	✓	✓	✓
Standard 3. Writing and Composition	RWC20.GR.1112.S.9.GLE.4.EO.f	Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. (CCSS: W.11–12.6)										
Standard 3. Writing and Composition	RWC20.GR.1112.S.9.GLE.4.EO.g	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. (CCSS W.11–12.10)										

Table 13: Grades 9–10 Aligned to Digital PSAT/NMSQT and PSAT 10

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.3.GLE.1.EO.a	Use Key Ideas and Details to i. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. (CCSS: RL.9-10.1) ii. Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text. (CCSS: RL.9-10.2) iii. Analyze how complex characters (for example: those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme. (CCSS: RL.9-10.3)	✓		✓		✓					
Standard 2. Reading for All Purposes	RWC20.GR.910.S.3.GLE.1.EO.b	Use Craft and Structure to: i. Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (for example: how the language evokes a sense of time and place; how it sets a formal or informal tone). (CCSS: RL.9-10.4) ii. Analyze how an author's choices concerning how to structure a text, order events within it (for example: parallel plots), and manipulate time (for example: pacing, flashbacks) create such effects as mystery, tension, or surprise. (CCSS: RL.9-10.5) iii. Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States,	✓			✓	✓					

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		drawing on a wide reading of world literature. (CCSS: RL.9-10.6)										
Standard 2. Reading for All Purposes	RWC20.GR.910.S.3.GLE.1.EO.c	Use Integration of Knowledge and Ideas to: i. Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment (for example: Auden's "Musée des Beaux Arts" and Breughel's Landscape with the Fall of Icarus). CCSS: RL.9-10.7) ii. Analyze how an author draws on and transforms source material in a specific work (for example: how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare). (CCSS: RL.9-10.9). iii. Analyze the influence of literary and/or historical context on a text and evaluate the contribution to society made by works of literature that deal with similar topics and themes.										
Standard 2. Reading for All Purposes	RWC20.GR.910.S.3.GLE.1.EO.d	d. Use Range of Reading and Complexity of Text to: i. By the end of grade 9, read and comprehend literature, including stories, dramas, and poems, in the grades 9-10 text complexity band proficiently, with scaffolding as needed at the high end of the range. ii. By the end of grade 10, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 9–10 text complexity band independently and proficiently. (CCSS: RL.9-10.10)	✓		✓	✓	✓					

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.4.GLE.2.EO.a	Use Key Ideas and Details to: i. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. (CCSS: RI.9-10.1) ii. Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text. (CCSS. RI.9-10.2) iii. Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them. (CCSS: RI.9-10.3)	✓	✓	✓		✓					
Standard 2. Reading for All Purposes	RWC20.GR.910.S.4.GLE.2.EO.b	Use Craft and Structure to: i. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (for example: how the language of a court opinion differs from that of a newspaper). (CCSS: RI.9-10.4) ii. Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (for example: a section or chapter). (CCSS: RI.9-10.5) iii. Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose. (CCSS: RI.9-10.6)	✓	✓		✓	✓	✓				

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.4.GLE.2.EO.c	Use Integration of Knowledge and Ideas to: i. Analyze various accounts of a subject told in different mediums (for example: a person's life story in both print and multimedia), determining which details are emphasized in each account. (CCSS: RI.9-10.7) ii. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning. (CCSS: RI.9-10-8) iii. By the end of grade 10, analyze seminal U.S. and world documents of historical and literary significance (for example: the Magna Carta, Machiavelli's The Prince, Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they influence and address related themes and concepts over the course of time. (adapted from CCSS: RI.9-10.9)	✓	✓	✓							
Standard 2. Reading for All Purposes	RWC20.GR.910.S.4.GLE.2.EO.d	d. Use Range of Reading and Complexity of Text to: i. By the end of grade 9, read and comprehend literary nonfiction in the grades 9-10 text complexity band proficiently, with scaffolding as needed at the high end of the range. ii. By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9-10 text complexity band independently and proficiently. (CCSS: RI.9-10.10)	✓	✓	✓	✓	✓	✓				

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.5.GLE.3.EO.a	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies. (CCSS: L.9-10.4) i. Use context (for example: the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. (CCSS: L.9-10.4a) ii. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (for example: analyze, analysis, analytical; advocate, advocacy). *(CCSS: L.9-10.4b) iii. Consult general and specialized reference materials (for example: dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology. (CCSS: L.9-10.4c) iv. Verify the preliminary determination of the meaning of a word or phrase (for example: by checking the inferred meaning in context or in a dictionary). (CCSS: L.9-10.4d)	✓	✓		✓						
Standard 2. Reading for All Purposes	RWC20.GR.910.S.5.GLE.3.EO.b	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. (CCSS: L.9-10.5) i. Interpret figures of speech (for example: euphemism, oxymoron) in context and analyze their role in the text. (CCSS: L.9-10.5a) ii. Analyze nuances in the meaning of words with similar denotations. (CCSS: L.9-10.5b)	✓	✓		✓			✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.5.GLE.3.EO.c	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. (CCSS: L.9–10.6)	✓	✓		✓			✓	✓		
Standard 3. Writing and Composition	RWC20.GR.910.S.6.GLE.1.EO.a	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. (CCSS: W.9-10.1) i. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence. (CCSS: W.9-10.1a) ii. Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns. (CCSS: W.9-10.1b) iii. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. (CCSS: W.9-10.1c) iv. Determine purpose for writing and use rhetorical appeals (i.e., ethos, pathos, logos) to address audience expectations and needs. v. Establish and maintain a formal style and objective tone while attending to the norms							✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		and conventions of the discipline in which they are writing. (CCSS: W.9-10.1d) vi. Provide a concluding statement or section that follows from and supports the argument presented. (CCSS: W.9-10.1e)										
Standard 3. Writing and Composition	RWC20.GR.910.S.7.GLE.2.EO.a	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. (CCSS: W.9-10.2) i. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (for example: headings), graphics (for example: figures, tables), and multimedia when useful to aiding comprehension. (CCSS: W.9-10.2a) ii. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. (CCSS: W.9-10.2b) iii. Use appropriate and varied transitions to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. (CCSS: W.9-10.2c) iv. Use precise language and domain-specific vocabulary to manage the complexity of the topic. (CCSS: W.9-10.2d) v. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. (CCSS: W.9-10.2e) vi. Provide a concluding statement or							✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		section that follows from and supports the information or explanation presented (for example, articulating implications or the significance of the topic). (CCSS: W.9-10.2f)										
Standard 3. Writing and Composition	RWC20.GR.910.S.8.GLE.3.EO.a	Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. (CCSS: W.9-10.3) i. Engage and orient the reader by setting out a problem, situation, or observation, establishing multiple points of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events. (CCSS: W.9-10.3a) ii. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. (CCSS: W.9-10.3b) iii. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole. (CCSS: W.9-10.3c) iv. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters. (CCSS: W.9-10.3d) v. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative. (CCSS: W.9-10.3e) vi. Use a range of stylistic devices (for example: poetic techniques, figurative language, imagery, graphic elements) to support the presentation of implicit or										

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		explicit themes or to engage and entertain the intended audience.										
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.a	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. (CCSS: L.9-10.1) i. Use parallel structure. (CCSS: L.9-10.1a) ii. Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent; noun, relative, adverbial) to convey specific meanings and add variety and interest to writing or presentations. (CCSS: L.9-10.1b)									✓	✓
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.b	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. (CCSS: L.9-10.2) i. Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses. (CCSS: L.9-10.2a) ii. Use a colon to introduce a list or quotation. (CCSS: L.9-10.2b) iii. Correctly spell frequently used words and consult reference materials (for example: dictionaries, both print and digital, spell check, and/or trusted peers and/or adults) to determine the spelling of less frequent vocabulary. (adapted from CCSS: L.9-10.2c).									✓	✓
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.c	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. (CCSS: L.9–10.3) i. Write and edit work so that it conforms to the guidelines in a style manual (for	✓	✓		✓			✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		example: MLA Handbook, or APA handbook) appropriate for the discipline and writing type. (adapted from CCSS: L.9–10.3a)										
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.d	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in expectations 1-2 above.) (CCSS: W.9–10.4)							✓	✓		
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.e	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (CCSS: W.9–10.5)							✓	✓	✓	✓
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.f	Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. (CCSS: W.9–10.6)										
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.g	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. (CCSS W.9–10.10)										

Table 14: Grades 9–10 Aligned to Digital PSAT 8/9

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.3.GLE.1.EO.a	Use Key Ideas and Details to i. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. (CCSS: RL.9-10.1) ii. Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text. (CCSS: RL.9-10.2) iii. Analyze how complex characters (for example: those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme. (CCSS: RL.9-10.3)	✓		✓		✓					
Standard 2. Reading for All Purposes	RWC20.GR.910.S.3.GLE.1.EO.b	Use Craft and Structure to: i. Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (for example: how the language evokes a sense of time and place; how it sets a formal or informal tone). (CCSS: RL.9-10.4) ii. Analyze how an author's choices concerning how to structure a text, order events within it (for example: parallel plots), and manipulate time (for example: pacing, flashbacks) create such effects as mystery, tension, or surprise. (CCSS: RL.9-10.5) iii. Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States,	✓			✓	✓					

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		drawing on a wide reading of world literature. (CCSS: RL.9-10.6)										
Standard 2. Reading for All Purposes	RWC20.GR.910.S.3.GLE.1.EO.c	Use Integration of Knowledge and Ideas to: i. Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment (for example: Auden's "Musée des Beaux Arts" and Breughel's Landscape with the Fall of Icarus). CCSS: RL.9-10.7) ii. Analyze how an author draws on and transforms source material in a specific work (for example: how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare). (CCSS: RL.9-10.9). iii. Analyze the influence of literary and/or historical context on a text and evaluate the contribution to society made by works of literature that deal with similar topics and themes.										
Standard 2. Reading for All Purposes	RWC20.GR.910.S.3.GLE.1.EO.d	d. Use Range of Reading and Complexity of Text to: i. By the end of grade 9, read and comprehend literature, including stories, dramas, and poems, in the grades 9-10 text complexity band proficiently, with scaffolding as needed at the high end of the range. ii. By the end of grade 10, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 9–10 text complexity band independently and proficiently. (CCSS: RL.9-10.10)	✓		✓	✓	✓					

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.4.GLE.2.EO.a	Use Key Ideas and Details to: i. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text. (CCSS: RI.9-10.1) ii. Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text. (CCSS. RI.9-10.2) iii. Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them. (CCSS: RI.9-10.3)	✓	✓	✓		✓					
Standard 2. Reading for All Purposes	RWC20.GR.910.S.4.GLE.2.EO.b	Use Craft and Structure to: i. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (for example: how the language of a court opinion differs from that of a newspaper). (CCSS: RI.9-10.4) ii. Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (for example: a section or chapter). (CCSS: RI.9-10.5) iii. Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose. (CCSS: RI.9-10.6)	✓	✓		✓	✓	✓				

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.4.GLE.2.EO.c	Use Integration of Knowledge and Ideas to: i. Analyze various accounts of a subject told in different mediums (for example: a person's life story in both print and multimedia), determining which details are emphasized in each account. (CCSS: RI.9-10.7) ii. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning. (CCSS: RI.9-10-8) iii. By the end of grade 10, analyze seminal U.S. and world documents of historical and literary significance (for example: the Magna Carta, Machiavelli's The Prince, Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they influence and address related themes and concepts over the course of time. (adapted from CCSS: RI.9-10.9)	✓	✓	✓							
Standard 2. Reading for All Purposes	RWC20.GR.910.S.4.GLE.2.EO.d	d. Use Range of Reading and Complexity of Text to: i. By the end of grade 9, read and comprehend literary nonfiction in the grades 9-10 text complexity band proficiently, with scaffolding as needed at the high end of the range. ii. By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9-10 text complexity band independently and proficiently. (CCSS: RI.9-10.10)	✓	✓	✓	✓	✓	✓				

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.5.GLE.3.EO.a	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies. (CCSS: L.9-10.4) i. Use context (for example: the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. (CCSS: L.9-10.4a) ii. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (for example: analyze, analysis, analytical; advocate, advocacy). *(CCSS: L.9-10.4b) iii. Consult general and specialized reference materials (for example: dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology. (CCSS: L.9-10.4c) iv. Verify the preliminary determination of the meaning of a word or phrase (for example: by checking the inferred meaning in context or in a dictionary). (CCSS: L.9-10.4d)	✓	✓		✓						
Standard 2. Reading for All Purposes	RWC20.GR.910.S.5.GLE.3.EO.b	Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. (CCSS: L.9-10.5) i. Interpret figures of speech (for example: euphemism, oxymoron) in context and analyze their role in the text. (CCSS: L.9-10.5a) ii. Analyze nuances in the meaning of words with similar denotations. (CCSS: L.9-10.5b)	✓	✓		✓			✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
Standard 2. Reading for All Purposes	RWC20.GR.910.S.5.GLE.3.EO.c	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. (CCSS: L.9–10.6)	✓	✓		✓			✓	✓		
Standard 3. Writing and Composition	RWC20.GR.910.S.6.GLE.1.EO.a	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. (CCSS: W.9-10.1) i. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence. (CCSS: W.9-10.1a) ii. Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns. (CCSS: W.9-10.1b) iii. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. (CCSS: W.9-10.1c) iv. Determine purpose for writing and use rhetorical appeals (i.e., ethos, pathos, logos) to address audience expectations and needs. v. Establish and maintain a formal style and objective tone while attending to the norms							✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		and conventions of the discipline in which they are writing. (CCSS: W.9-10.1d) vi. Provide a concluding statement or section that follows from and supports the argument presented. (CCSS: W.9-10.1e)										
Standard 3. Writing and Composition	RWC20.GR.910.S.7.GLE.2.EO.a	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. (CCSS: W.9-10.2) i. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (for example: headings), graphics (for example: figures, tables), and multimedia when useful to aiding comprehension. (CCSS: W.9-10.2a) ii. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. (CCSS: W.9-10.2b) iii. Use appropriate and varied transitions to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. (CCSS: W.9-10.2c) iv. Use precise language and domain-specific vocabulary to manage the complexity of the topic. (CCSS: W.9-10.2d) v. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. (CCSS: W.9-10.2e) vi. Provide a concluding statement or							✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		section that follows from and supports the information or explanation presented (for example, articulating implications or the significance of the topic). (CCSS: W.9-10.2f)										
Standard 3. Writing and Composition	RWC20.GR.910.S.8.GLE.3.EO.a	Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. (CCSS: W.9-10.3) i. Engage and orient the reader by setting out a problem, situation, or observation, establishing multiple points of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events. (CCSS: W.9-10.3a) ii. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. (CCSS: W.9-10.3b) iii. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole. (CCSS: W.9-10.3c) iv. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters. (CCSS: W.9-10.3d) v. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative. (CCSS: W.9-10.3e) vi. Use a range of stylistic devices (for example: poetic techniques, figurative language, imagery, graphic elements) to support the presentation of implicit or										

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		explicit themes or to engage and entertain the intended audience.										
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.a	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. (CCSS: L.9-10.1) i. Use parallel structure. (CCSS: L.9-10.1a) ii. Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent; noun, relative, adverbial) to convey specific meanings and add variety and interest to writing or presentations. (CCSS: L.9-10.1b)									✓	✓
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.b	Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. (CCSS: L.9-10.2) i. Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses. (CCSS: L.9-10.2a) ii. Use a colon to introduce a list or quotation. (CCSS: L.9-10.2b) iii. Correctly spell frequently used words and consult reference materials (for example: dictionaries, both print and digital, spell check, and/or trusted peers and/or adults) to determine the spelling of less frequent vocabulary. (adapted from CCSS: L.9-10.2c).									✓	✓
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.c	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. (CCSS: L.9–10.3) i. Write and edit work so that it conforms to the guidelines in a style manual (for	✓	✓		✓			✓	✓		

CO Standards			Information and Ideas			Craft and Structure			Expression of Ideas		Standard English Conventions	
			Central Ideas and Details	Inferences	Command of Evidence	Words in Context	Text Structure and Purpose	Cross-Text Connections	Rhetorical Synthesis	Transitions	Boundaries	Form, Structure, and Sense
		example: MLA Handbook, or APA handbook) appropriate for the discipline and writing type. (adapted from CCSS: L.9–10.3a)										
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.d	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in expectations 1-2 above.) (CCSS: W.9–10.4)							✓	✓		
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.e	Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (CCSS: W.9–10.5)							✓	✓	✓	✓
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.f	Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically. (CCSS: W.9–10.6)										
Standard 3. Writing and Composition	RWC20.GR.910.S.9.GLE.4.EO.g	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. (CCSS W.9–10.10)										

Appendix C: Alignments of Math Standards to Digital SAT Suite

The following tables detail the Colorado Academic Standards–digital SAT Suite alignments using the standards as the organizing principle.

Table 15: Algebra I Aligned to Digital SAT

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 1. Number and Quantity	MA.HS.N-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. (CCSS: HS.N-RN.A.1)																			
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. (CCSS: HS.A-SSE.A.2)	✓	✓	✓			✓	✓												
Standard 2. Algebra and Functions	MA.HS.A-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. (CCSS: HS.A-SSE.B.3) a. Factor a quadratic expression to reveal the zeros of the function it defines. (CCSS: HS.A-SSE.B.3.a) b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. (CCSS: HS.A-SSE.B.3.b) c. Use the properties of exponents to transform expressions for exponential functions. (CCSS: HS.A-SSE.B.3.c)						✓		✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. (CCSS: HS.A-CED.A.3)			✓		✓			✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓												

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A.REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. (CCSS: HS.A-REI.C.7)							✓												
Standard 2. Algebra and Functions	MA.HS.F-IF.A.3	Demonstrate that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. (CCSS: HS.F-IF.A.3)																			
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓																	
Standard 2. Algebra and Functions	MA.HS.F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (CCSS: HS.F-IF.C.8) a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. (CCSS: HS.F-IF.C.8.a) b. Use the properties of exponents to interpret expressions for exponential functions. (CCSS: HS.F-IF.C.8.b)								✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). (CCSS: HS.F-IF.C.9)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-BF.B.4	Find inverse functions. (CCSS: HS.F-BF.B.4) a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. (CCSS: HS.F-BF.B.4.a)																			
Standard 1. Number and Quantity	MA.HS.N-RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents. (CCSS: HS.N-RN.A.2)						✓													

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 1. Number and Quantity	MA.HS.N-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (CCSS: HS.N-Q.A.1)									✓										
Standard 1. Number and Quantity	MA.HS.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. (CCSS: HS.N-Q.A.2)																			
Standard 1. Number and Quantity	MA.HS.N-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (CCSS: HS.N-Q.A.3)																			
Standard 2. Algebra and Functions	MA.HS.A-APR.A.1	Explain that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. (CCSS: HS.A-APR.A.1)						✓													
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓			✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓											
Standard 2. Algebra and Functions	MA.HS.A-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (CCSS: HS.A-REI.A.1)	✓		✓	✓	✓		✓	✓											
Standard 2. Algebra and Functions	MA.HS.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS: HS.A-REI.B.3)	✓				✓				✓										

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A.REI.B.4	Solve quadratic equations in one variable. (CCSS: HS.A-REI.B.4) a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2=q$ that has the same solutions. Derive the quadratic formula from this form. (CCSS: HS.A-REI.B.4.a) b. Solve quadratic equations (e.g., for $x^2=49$) by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. (CCSS: HS.A-REI.B.4.b)							✓													
Standard 2. Algebra and Functions	MA.HS.A-REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. (CCSS: HS.A-REI.C.5)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. (CCSS: HS.A-REI.C.6)				✓															
Standard 2. Algebra and Functions	MA.HS.A-REI.D.10	Explain that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). (CCSS: HS.A-REI.D.10)		✓	✓					✓											
Standard 2. Algebra and Functions	MA.HS.A-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. (CCSS: HS.A-REI.D.11)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. (CCSS: HS.A-REI.D.12)					✓														
Standard 2. Algebra and Functions	MA.HS.F-IF.A.1	Explain that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. (CCSS: HS.F-IF.A.1)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (CCSS: HS.F-IF.A.2)		✓						✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓							

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. (CCSS: HS.F-BF.A.2)																			
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓						✓												

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. (CCSS: HS.F-LE.A.1) a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. (CCSS: HS.F-LE.A.1.a) b. Identify situations in which one quantity changes at a constant rate per unit interval relative to another. (CCSS: HS.F-LE.A.1.b) c. Identify situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. (CCSS: HS.F-LE.A.1.c)		✓						✓				✓							
Standard 2. Algebra and Functions	MA.HS.F-LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). (CCSS: HS.F-LE.A.2)		✓						✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-LE.A.3	Use graphs and tables to describe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. (CCSS: HS.F-LE.A.3)								✓				✓							
Standard 2. Algebra and Functions	MA.HS.F-LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context. (CCSS: HS.F-LE.B.5)		✓						✓											
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.1	Model data in context with plots on the real number line (dot plots, histograms, and box plots). (CCSS: HS.S-ID.A.1)											✓								
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. (CCSS: HS.S-ID.A.2)											✓								
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). (CCSS: HS.S-ID.A.3)											✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. (CCSS: HS.S-ID.B.5)													✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. (CCSS: HS.S-ID.B.6) a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. (CCSS: HS.S-ID.B.6.a) b. Informally assess the fit of a function by plotting and analyzing residuals. (CCSS: HS.S-ID.B.6.b) c. Fit a linear function for a scatter plot that suggests a linear association. (CCSS: HS.S-ID.B.6.c)											✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.7	Distinguish between correlation and causation. (CCSS: HS.S-ID.C.9)																			
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. (CCSS: HS.S-ID.C.7)												✓							
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.8	Using technology, compute and interpret the correlation coefficient of a linear fit. (CCSS: HS.S-ID.C.8)																			

Table 16: Integrated Math I Aligned to Digital SAT

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. (CCSS: HS.A-CED.A.3)			✓		✓			✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓												
Standard 2. Algebra and Functions	MA.HS.F-IF.A.3	Demonstrate that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. (CCSS: HS.F-IF.A.3)																			
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓											
Standard 4. Geometry	MA.HS.G-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically. (CCSS: HS.G-GPE.B.4)																			
Standard 1. Number and Quantity	MA.HS.N-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (CCSS: HS.N-Q.A.1)									✓										
Standard 1. Number and Quantity	MA.HS.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. (CCSS: HS.N-Q.A.2)																			
Standard 1. Number and Quantity	MA.HS.N-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (CCSS: HS.N-Q.A.3)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓			✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓											
Standard 2. Algebra and Functions	MA.HS.A-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (CCSS: HS.A-REI.A.1)	✓		✓	✓	✓		✓	✓											
Standard 2. Algebra and Functions	MA.HS.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS: HS.A-REI.B.3)	✓				✓				✓										
Standard 2. Algebra and Functions	MA.HS.A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. (CCSS: HS.A-REI.C.6)				✓															

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. (CCSS: HS.A-REI.D.11)																			
Standard 2. Algebra and Functions	MA.HS.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. (CCSS: HS.A-REI.D.12)					✓														

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-IF.A.1	Explain that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. (CCSS: HS.F-IF.A.1)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (CCSS: HS.F-IF.A.2)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓							
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. (CCSS: HS.F-BF.A.2)																			
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓						✓											
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.1	Model data in context with plots on the real number line (dot plots, histograms, and box plots). (CCSS: HS.S-ID.A.1)											✓								
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. (CCSS: HS.S-ID.A.2)											✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). (CCSS: HS.S-ID.A.3)											✓								
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. (CCSS: HS.S-ID.B.5)													✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. (CCSS: HS.S-ID.B.6) a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. (CCSS: HS.S-ID.B.6.a) b. Informally assess the fit of a function by plotting and analyzing residuals. (CCSS: HS.S-ID.B.6.b) c. Fit a linear function for a scatter plot that suggests a linear association. (CCSS: HS.S-ID.B.6.c)												✓							

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.7	Distinguish between correlation and causation. (CCSS: HS.S-ID.C.9)																			
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.8	Using technology, compute and interpret the correlation coefficient of a linear fit. (CCSS: HS.S-ID.C.8)																			
Standard 4. Geometry	MA.HS.G-CO.A.1	State precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. (CCSS: HS.G-CO.A.1)																	✓	✓	✓
Standard 4. Geometry	MA.HS.G-CO.A.2	Represent transformations in the plane using e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). (CCSS: HS.G-CO.A.2)																			
Standard 4. Geometry	MA.HS.G-CO.A.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. (CCSS: HS.G-CO.A.3)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-CO.A.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. (CCSS: HS.G-CO.A.4)																			
Standard 4. Geometry	MA.HS.G-CO.A.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using appropriate tools (e.g., graph paper, tracing paper, or geometry software). Specify a sequence of transformations that will carry a given figure onto another. (CCSS: HS.G-CO.A.5)																			
Standard 4. Geometry	MA.HS.G-CO.B.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. (CCSS: HS.G-CO.B.6)																			
Standard 4. Geometry	MA.HS.G-CO.B.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. (CCSS: HS.G-CO.B.7)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-CO.B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. (CCSS: HS.G-CO.B.8)																	✓		
Standard 4. Geometry	MA.HS.G-CO.C.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. (CCSS: HS.G-CO.C.11)																	✓		
Standard 4. Geometry	MA.HS.G-CO.D.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line. (CCSS: HS.G-CO.D.12)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-GPE.B.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). (CCSS: HS.G-GPE.B.5)			✓																
Standard 4. Geometry	MA.HS.G-GPE.B.7	Use coordinates and the distance formula to compute perimeters of polygons and areas of triangles and rectangles. (CCSS: HS.G-GPE.B.7)																✓			

Table 17: Integrated Math II Aligned to Digital SAT

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 1. Number and Quantity	MA.HS.N-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. (CCSS: HS.N-RN.A.1)																			
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓											
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. (CCSS: HS.A-SSE.A.2)	✓	✓	✓			✓	✓												
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓												

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A.REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. (CCSS: HS.A-REI.C.7)							✓												
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓																	
Standard 2. Algebra and Functions	MA.HS.F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (CCSS: HS.F-IF.C.8) a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. (CCSS: HS.F-IF.C.8.a) b. Use the properties of exponents to interpret expressions for exponential functions. (CCSS: HS.F-IF.C.8.b)								✓											
Standard 2. Algebra and Functions	MA.HS.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). (CCSS: HS.F-IF.C.9)		✓						✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-BF.B.4	Find inverse functions. (CCSS: HS.F-BF.B.4) a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. (CCSS: HS.F-BF.B.4.a)																			
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. (CCSS: HS.S-CP.A.4)													✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. (CCSS: HS.S-CP.A.5)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically. (CCSS: HS.G-GPE.B.4)																			
Standard 1. Number and Quantity	MA.HS.N-CN.A.1	Define complex number i such that $i^2 = -1$, and show that every complex number has the form $a + bi$ where a and b are real numbers. (CCSS: HS.N-CN.A.1)																			
Standard 1. Number and Quantity	MA.HS.N-CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. (CCSS: HS.N-CN.A.2)																			
Standard 1. Number and Quantity	MA.HS.N-CN.C.7	Solve quadratic equations with real coefficients that have complex solutions. (CCSS: HS.N-CN.C.7)																			
Standard 2. Algebra and Functions	MA.HS.A-APR.A.1	Explain that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. (CCSS: HS.A-APR.A.1)						✓													
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓			✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓											
Standard 2. Algebra and Functions	MA.HS.A.REI.B.4	Solve quadratic equations in one variable. (CCSS: HS.A-REI.B.4) a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2=q$ that has the same solutions. Derive the quadratic formula from this form. (CCSS: HS.A-REI.B.4.a) b. Solve quadratic equations (e.g., for $x^2=49$) by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. (CCSS: HS.A-REI.B.4.b)							✓												

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change, presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓							

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓						✓											
Standard 2. Algebra and Functions	MA.HS.F-LE.A.3	Use graphs and tables to describe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. (CCSS: HS.F-LE.A.3)								✓				✓							
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.2	Explain that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. (CCSS: HS.S-CP.A.2)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.3	Using the conditional probability of A given B as $P(AandB)/P(B)$, interpret the independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. (CCSS: HS.S-CP.A.3)																			
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.B.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model. (CCSS: HS.S-CP.B.6)													✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.B.7	Apply the Addition Rule, $P(A\ or\ B) = P(A) + P(B) - P(A\ and\ B)$, and interpret the answer in terms of the model. (CCSS: HS.S-CP.B.7)													✓						
Standard 4. Geometry	MA.HS.G-CO.C.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints. (CCSS: HS.G-CO.C.9)																	✓		

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-CO.C.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to $180°$; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point. (CCSS: HS.G-CO.C.10)																	✓		
Standard 4. Geometry	MA.HS.G-CO.C.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. (CCSS: HS.G-CO.C.11)																	✓		

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-SRT.A.1	Verify experimentally the properties of dilations given by a center and a scale factor. (CCSS: HS.G-SRT.A.1) a. Show that a dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. (CCSS: HS.G-SRT.A.1.a) b. Show that the dilation of a line segment is longer or shorter in the ratio given by the scale factor. (CCSS: HS.G-SRT.A.1.b)																✓	✓		
Standard 4. Geometry	MA.HS.G-SRT.A.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. (CCSS: HS.G-SRT.A.2)																			
Standard 4. Geometry	MA.HS.G-SRT.A.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. (CCSS: HS.G-SRT.A.3)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-SRT.B.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity. (CCSS: HS.G-SRT.B.4)																	✓	✓	
Standard 4. Geometry	MA.HS.G-SRT.B.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. (CCSS: HS.G-SRT.B.5)																	✓		
Standard 4. Geometry	MA.HS.G-SRT.C.6	Explain that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. (CCSS: HS.G-SRT.C.6)																		✓	
Standard 4. Geometry	MA.HS.G-SRT.C.7	Explain and use the relationship between the sine and cosine of complementary angles. (CCSS: HS.G-SRT.C.7)																		✓	
Standard 4. Geometry	MA.HS.G-SRT.C.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. (CCSS: HS.G-SRT.C.8)																		✓	
Standard 4. Geometry	MA.HS.G-C.A.1	Prove that all circles are similar. (CCSS: HS.G-C.A.1)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-C.A.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle. (CCSS: HS.G-C.A.2)																			
Standard 4. Geometry	MA.HS.G-C.A.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. (CCSS: HS.G-C.A.3)																			
Standard 4. Geometry	MA.HS.G-GPE.A.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. (CCSS: HS.G-GPE.A.1)																			
Standard 4. Geometry	MA.HS.G-GMD.A.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments. (CCSS: HS.G-GMD.A.1)																			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis							Geometry and Trigonometry			
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable and systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data	Two-variable data	Probability and conditional probability	Inference from sample statistics and margin of error	Evaluating statistical claim	Area and volume	Lines, angles, and triangles	Right triangles and trigonometry	Circles
Standard 4. Geometry	MA.HS.G-GMD.A.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. (CCSS: HS.G-GMD.A.3)																✓			

Table 18: Algebra I Aligned to Digital PSAT/NMSQT and PSAT 10

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 1. Number and Quantity	MA.HS.N-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. (CCSS: HS.N-RN.A.1)																	
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓									
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. (CCSS: HS.A-SSE.A.2)	✓	✓	✓			✓	✓										

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. (CCSS: HS.A-SSE.B.3) a. Factor a quadratic expression to reveal the zeros of the function it defines. (CCSS: HS.A-SSE.B.3.a) b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. (CCSS: HS.A-SSE.B.3.b) c. Use the properties of exponents to transform expressions for exponential functions. (CCSS: HS.A-SSE.B.3.c)						✓		✓									
Standard 2. Algebra and Functions	MA.HS.A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. (CCSS: HS.A-CED.A.3)			✓		✓			✓									
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓										
Standard 2. Algebra and Functions	MA.HS.A.REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. (CCSS: HS.A-REI.C.7)							✓										

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.A.3	Demonstrate that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. (CCSS: HS.F-IF.A.3)																	
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓															
Standard 2. Algebra and Functions	MA.HS.F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (CCSS: HS.F-IF.C.8) a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. (CCSS: HS.F-IF.C.8.a) b. Use the properties of exponents to interpret expressions for exponential functions. (CCSS: HS.F-IF.C.8.b)								✓									
Standard 2. Algebra and Functions	MA.HS.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). (CCSS: HS.F-IF.C.9)		✓						✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-BF.B.4	Find inverse functions. (CCSS: HS.F-BF.B.4) a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. (CCSS: HS.F-BF.B.4.a)																	
Standard 1. Number and Quantity	MA.HS.N-RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents. (CCSS: HS.N-RN.A.2)																	
Standard 1. Number and Quantity	MA.HS.N-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (CCSS: HS.N-Q.A.1)									✓								
Standard 1. Number and Quantity	MA.HS.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. (CCSS: HS.N-Q.A.2)																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 1. Number and Quantity	MA.HS.N-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (CCSS: HS.N-Q.A.3)																	
Standard 2. Algebra and Functions	MA.HS.A-APR.A.1	Explain that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. (CCSS: HS.A-APR.A.1)						✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓			✓									
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓									
Standard 2. Algebra and Functions	MA.HS.A-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (CCSS: HS.A-REI.A.1)	✓		✓	✓	✓		✓	✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS: HS.A-REI.B.3)	✓				✓				✓								
Standard 2. Algebra and Functions	MA.HS.A.REI.B.4	Solve quadratic equations in one variable. (CCSS: HS.A-REI.B.4) a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. (CCSS: HS.A-REI.B.4.a) b. Solve quadratic equations (e.g., for $x^2 = 49$) by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. (CCSS: HS.A-REI.B.4.b)							✓											
Standard 2. Algebra and Functions	MA.HS.A-REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. (CCSS: HS.A-REI.C.5)																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. (CCSS: HS.A-REI.C.6)				✓													
Standard 2. Algebra and Functions	MA.HS.A-REI.D.10	Explain that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). (CCSS: HS.A-REI.D.10)		✓	✓					✓									
Standard 2. Algebra and Functions	MA.HS.A-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. (CCSS: HS.A-REI.D.11)																	
Standard 2. Algebra and Functions	MA.HS.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. (CCSS: HS.A-REI.D.12)					✓												

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.A.1	Explain that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. (CCSS: HS.F-IF.A.1)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (CCSS: HS.F-IF.A.2)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓					
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. (CCSS: HS.F-BF.A.2)																	
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓						✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. (CCSS: HS.F-LE.A.1) a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. (CCSS: HS.F-LE.A.1.a) b. Identify situations in which one quantity changes at a constant rate per unit interval relative to another. (CCSS: HS.F-LE.A.1.b) c. Identify situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. (CCSS: HS.F-LE.A.1.c)		✓						✓				✓					
Standard 2. Algebra and Functions	MA.HS.F-LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). (CCSS: HS.F-LE.A.2)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-LE.A.3	Use graphs and tables to describe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. (CCSS: HS.F-LE.A.3)								✓				✓					

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context. (CCSS: HS.F-LE.B.5)		✓						✓									
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.1	Model data in context with plots on the real number line (dot plots, histograms, and box plots). (CCSS: HS.S-ID.A.1)											✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. (CCSS: HS.S-ID.A.2)											✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). (CCSS: HS.S-ID.A.3)											✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. (CCSS: HS.S-ID.B.5)													✓				

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. (CCSS: HS.S-ID.B.6) a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. (CCSS: HS.S-ID.B.6.a) b. Informally assess the fit of a function by plotting and analyzing residuals. (CCSS: HS.S-ID.B.6.b) c. Fit a linear function for a scatter plot that suggests a linear association. (CCSS: HS.S-ID.B.6.c)												✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.7	Distinguish between correlation and causation. (CCSS: HS.S-ID.C.9)																	
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. (CCSS: HS.S-ID.C.7)												✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.8	Using technology, compute and interpret the correlation coefficient of a linear fit. (CCSS: HS.S-ID.C.8)																	

Table 19: Integrated Math I Aligned to Digital PSAT/NMSQT and PSAT 10

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓									
Standard 2. Algebra and Functions	MA.HS.A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. (CCSS: HS.A-CED.A.3)			✓		✓			✓									
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓										
Standard 2. Algebra and Functions	MA.HS.F-IF.A.3	Demonstrate that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. (CCSS: HS.F-IF.A.3)																	
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓															

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓									
Standard 4. Geometry	MA.HS.G-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically. (CCSS: HS.G-GPE.B.4)																	
Standard 1. Number and Quantity	MA.HS.N-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (CCSS: HS.N-Q.A.1)									✓								
Standard 1. Number and Quantity	MA.HS.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. (CCSS: HS.N-Q.A.2)																	
Standard 1. Number and Quantity	MA.HS.N-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (CCSS: HS.N-Q.A.3)																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓			✓									
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓									
Standard 2. Algebra and Functions	MA.HS.A-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (CCSS: HS.A-REI.A.1)	✓		✓	✓	✓		✓	✓									
Standard 2. Algebra and Functions	MA.HS.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS: HS.A-REI.B.3)	✓				✓				✓								
Standard 2. Algebra and Functions	MA.HS.A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. (CCSS: HS.A-REI.C.6)				✓													

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. (CCSS: HS.A-REI.D.11)																	
Standard 2. Algebra and Functions	MA.HS.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. (CCSS: HS.A-REI.D.12)					✓												

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.A.1	Explain that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. (CCSS: HS.F-IF.A.1)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (CCSS: HS.F-IF.A.2)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓					
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. (CCSS: HS.F-BF.A.2)																	
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓						✓									
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.1	Model data in context with plots on the real number line (dot plots, histograms, and box plots). (CCSS: HS.S-ID.A.1)											✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. (CCSS: HS.S-ID.A.2)											✓						
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). (CCSS: HS.S-ID.A.3)											✓						

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. (CCSS: HS.S-ID.B.5)													✓				
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. (CCSS: HS.S-ID.B.6) a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. (CCSS: HS.S-ID.B.6.a) b. Informally assess the fit of a function by plotting and analyzing residuals. (CCSS: HS.S-ID.B.6.b) c. Fit a linear function for a scatter plot that suggests a linear association. (CCSS: HS.S-ID.B.6.c)												✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.7	Distinguish between correlation and causation. (CCSS: HS.S-ID.C.9)																	
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.8	Using technology, compute and interpret the correlation coefficient of a linear fit. (CCSS: HS.S-ID.C.8)																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-CO.A.1	State precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. (CCSS: HS.G-CO.A.1)																✓	✓
Standard 4. Geometry	MA.HS.G-CO.A.2	Represent transformations in the plane using e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). (CCSS: HS.G-CO.A.2)																	
Standard 4. Geometry	MA.HS.G-CO.A.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. (CCSS: HS.G-CO.A.3)																	
Standard 4. Geometry	MA.HS.G-CO.A.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. (CCSS: HS.G-CO.A.4)																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-CO.A.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using appropriate tools (e.g., graph paper, tracing paper, or geometry software). Specify a sequence of transformations that will carry a given figure onto another. (CCSS: HS.G-CO.A.5)																	
Standard 4. Geometry	MA.HS.G-CO.B.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. (CCSS: HS.G-CO.B.6)																	
Standard 4. Geometry	MA.HS.G-CO.B.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. (CCSS: HS.G-CO.B.7)																	
Standard 4. Geometry	MA.HS.G-CO.B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. (CCSS: HS.G-CO.B.8)																✓	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-CO.C.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. (CCSS: HS.G-CO.C.11)																✓	
Standard 4. Geometry	MA.HS.G-CO.D.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line. (CCSS: HS.G-CO.D.12)																	
Standard 4. Geometry	MA.HS.G-GPE.B.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). (CCSS: HS.G-GPE.B.5)			✓														
Standard 4. Geometry	MA.HS.G-GPE.B.7	Use coordinates and the distance formula to compute perimeters of polygons and areas of triangles and rectangles. (CCSS: HS.G-GPE.B.7)															✓		

Table 20: Integrated Math II Aligned to Digital PSAT/NMSQT and PSAT 10

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 1. Number and Quantity	MA.HS.N-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. (CCSS: HS.N-RN.A.1)																	
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓									
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. (CCSS: HS.A-SSE.A.2)	✓	✓	✓			✓	✓										
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓										
Standard 2. Algebra and Functions	MA.HS.A.REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. (CCSS: HS.A-REI.C.7)							✓										

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓															
Standard 2. Algebra and Functions	MA.HS.F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (CCSS: HS.F-IF.C.8) a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. (CCSS: HS.F-IF.C.8.a) b. Use the properties of exponents to interpret expressions for exponential functions. (CCSS: HS.F-IF.C.8.b)								✓									
Standard 2. Algebra and Functions	MA.HS.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). (CCSS: HS.F-IF.C.9)		✓						✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-BF.B.4	Find inverse functions. (CCSS: HS.F-BF.B.4) a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. (CCSS: HS.F-BF.B.4.a)																	
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. (CCSS: HS.S-CP.A.4)													✓				
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. (CCSS: HS.S-CP.A.5)																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically. (CCSS: HS.G-GPE.B.4)																	
Standard 1. Number and Quantity	MA.HS.N-CN.A.1	Define complex number i such that $i^2 = -1$, and show that every complex number has the form $a + bi$ where a and b are real numbers. (CCSS: HS.N-CN.A.1)																	
Standard 1. Number and Quantity	MA.HS.N-CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. (CCSS: HS.N-CN.A.2)																	
Standard 1. Number and Quantity	MA.HS.N-CN.C.7	Solve quadratic equations with real coefficients that have complex solutions. (CCSS: HS.N-CN.C.7)																	
Standard 2. Algebra and Functions	MA.HS.A-APR.A.1	Explain that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. (CCSS: HS.A-APR.A.1)						✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓			✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓									
Standard 2. Algebra and Functions	MA.HS.A.REI.B.4	Solve quadratic equations in one variable. (CCSS: HS.A-REI.B.4) a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. (CCSS: HS.A-REI.B.4.a) b. Solve quadratic equations (e.g., for $x^2 = 49$) by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. (CCSS: HS.A-REI.B.4.b)							✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change, presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓					

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-LE.A.3	Use graphs and tables to describe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. (CCSS: HS.F-LE.A.3)								✓				✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.2	Explain that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. (CCSS: HS.S-CP.A.2)																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.3	Using the conditional probability of A given B as $P(AandB)/P(B)$, interpret the independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. (CCSS: HS.S-CP.A.3)																	
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.B.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model. (CCSS: HS.S-CP.B.6)													✓				
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.B.7	Apply the Addition Rule, $P(A\ or\ B) = P(A) + P(B) - P(A\ and\ B)$, and interpret the answer in terms of the model. (CCSS: HS.S-CP.B.7)													✓				
Standard 4. Geometry	MA.HS.G-CO.C.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints. (CCSS: HS.G-CO.C.9)																✓	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-CO.C.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to $180°$; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point. (CCSS: HS.G-CO.C.10)																✓	
Standard 4. Geometry	MA.HS.G-CO.C.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. (CCSS: HS.G-CO.C.11)																✓	
Standard 4. Geometry	MA.HS.G-SRT.A.1	Verify experimentally the properties of dilations given by a center and a scale factor. (CCSS: HS.G-SRT.A.1) a. Show that a dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. (CCSS: HS.G-SRT.A.1.a) b. Show that the dilation of a line segment is longer or shorter in the ratio given by the scale factor. (CCSS: HS.G-SRT.A.1.b)															✓	✓	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-SRT.A.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. (CCSS: HS.G-SRT.A.2)																	
Standard 4. Geometry	MA.HS.G-SRT.A.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. (CCSS: HS.G-SRT.A.3)																	
Standard 4. Geometry	MA.HS.G-SRT.B.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity. (CCSS: HS.G-SRT.B.4)																✓	✓
Standard 4. Geometry	MA.HS.G-SRT.B.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. (CCSS: HS.G-SRT.B.5)																✓	
Standard 4. Geometry	MA.HS.G-SRT.C.6	Explain that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. (CCSS: HS.G-SRT.C.6)																	✓

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-SRT.C.7	Explain and use the relationship between the sine and cosine of complementary angles. (CCSS: HS.G-SRT.C.7)																	✓
Standard 4. Geometry	MA.HS.G-SRT.C.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. (CCSS: HS.G-SRT.C.8)																	✓
Standard 4. Geometry	MA.HS.G-C.A.1	Prove that all circles are similar. (CCSS: HS.G-C.A.1)																	
Standard 4. Geometry	MA.HS.G-C.A.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle. (CCSS: HS.G-C.A.2)																	
Standard 4. Geometry	MA.HS.G-C.A.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. (CCSS: HS.G-C.A.3)																	
Standard 4. Geometry	MA.HS.G-GPE.A.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. (CCSS: HS.G-GPE.A.1)																	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis						Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Inference from sample statistics	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-GMD.A.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments. (CCSS: HS.G-GMD.A.1)																	
Standard 4. Geometry	MA.HS.G-GMD.A.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. (CCSS: HS.G-GMD.A.3)															✓		

Table 21: Algebra I Aligned to Digital PSAT 8/9

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 1. Number and Quantity	MA.HS.N-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. (CCSS: HS.N-RN.A.1)																
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓								
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. (CCSS: HS.A-SSE.A.2)	✓	✓	✓			✓	✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. (CCSS: HS.A-SSE.B.3) a. Factor a quadratic expression to reveal the zeros of the function it defines. (CCSS: HS.A-SSE.B.3.a) b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. (CCSS: HS.A-SSE.B.3.b) c. Use the properties of exponents to transform expressions for exponential functions. (CCSS: HS.A-SSE.B.3.c)						✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. (CCSS: HS.A-CED.A.3)			✓		✓			✓								
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓									
Standard 2. Algebra and Functions	MA.HS.A.REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. (CCSS: HS.A-REI.C.7)							✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.A.3	Demonstrate that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. (CCSS: HS.F-IF.A.3)																
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓														
Standard 2. Algebra and Functions	MA.HS.F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (CCSS: HS.F-IF.C.8) a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. (CCSS: HS.F-IF.C.8.a) b. Use the properties of exponents to interpret expressions for exponential functions. (CCSS: HS.F-IF.C.8.b)								✓								
Standard 2. Algebra and Functions	MA.HS.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). (CCSS: HS.F-IF.C.9)		✓						✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-BF.B.4	Find inverse functions. (CCSS: HS.F-BF.B.4) a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. (CCSS: HS.F-BF.B.4.a)																
Standard 1. Number and Quantity	MA.HS.N-RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents. (CCSS: HS.N-RN.A.2)																
Standard 1. Number and Quantity	MA.HS.N-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (CCSS: HS.N-Q.A.1)									✓							
Standard 1. Number and Quantity	MA.HS.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. (CCSS: HS.N-Q.A.2)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 1. Number and Quantity	MA.HS.N-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (CCSS: HS.N-Q.A.3)																
Standard 2. Algebra and Functions	MA.HS.A-APR.A.1	Explain that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. (CCSS: HS.A-APR.A.1)						✓										
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓								
Standard 2. Algebra and Functions	MA.HS.A-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (CCSS: HS.A-REI.A.1)	✓		✓	✓	✓		✓	✓								
Standard 2. Algebra and Functions	MA.HS.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS: HS.A-REI.B.3)	✓				✓				✓							

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A.REI.B.4	Solve quadratic equations in one variable. (CCSS: HS.A-REI.B.4) a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. (CCSS: HS.A-REI.B.4.a) b. Solve quadratic equations (e.g., for $x^2 = 49$) by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. (CCSS: HS.A-REI.B.4.b)							✓										
Standard 2. Algebra and Functions	MA.HS.A-REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. (CCSS: HS.A-REI.C.5)																
Standard 2. Algebra and Functions	MA.HS.A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. (CCSS: HS.A-REI.C.6)				✓												

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-REI.D.10	Explain that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). (CCSS: HS.A-REI.D.10)		✓	✓					✓								
Standard 2. Algebra and Functions	MA.HS.A-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. (CCSS: HS.A-REI.D.11)																
Standard 2. Algebra and Functions	MA.HS.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. (CCSS: HS.A-REI.D.12)					✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.A.1	Explain that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. (CCSS: HS.F-IF.A.1)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (CCSS: HS.F-IF.A.2)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓				

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓									
Standard 2. Algebra and Functions	MA.HS.F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. (CCSS: HS.F-BF.A.2)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓														
Standard 2. Algebra and Functions	MA.HS.F-LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. (CCSS: HS.F-LE.A.1) a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. (CCSS: HS.F-LE.A.1.a) b. Identify situations in which one quantity changes at a constant rate per unit interval relative to another. (CCSS: HS.F-LE.A.1.b) c. Identify situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. (CCSS: HS.F-LE.A.1.c)		✓						✓				✓				

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). (CCSS: HS.F-LE.A.2)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-LE.A.3	Use graphs and tables to describe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. (CCSS: HS.F-LE.A.3)								✓								
Standard 2. Algebra and Functions	MA.HS.F-LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context. (CCSS: HS.F-LE.B.5)		✓						✓								
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.1	Model data in context with plots on the real number line (dot plots, histograms, and box plots). (CCSS: HS.S-ID.A.1)											✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. (CCSS: HS.S-ID.A.2)											✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). (CCSS: HS.S-ID.A.3)											✓					

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. (CCSS: HS.S-ID.B.5)													✓			
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. (CCSS: HS.S-ID.B.6) a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. (CCSS: HS.S-ID.B.6.a) b. Informally assess the fit of a function by plotting and analyzing residuals. (CCSS: HS.S-ID.B.6.b) c. Fit a linear function for a scatter plot that suggests a linear association. (CCSS: HS.S-ID.B.6.c)												✓				
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.7	Distinguish between correlation and causation. (CCSS: HS.S-ID.C.9)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. (CCSS: HS.S-ID.C.7)												✓				
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.8	Using technology, compute and interpret the correlation coefficient of a linear fit. (CCSS: HS.S-ID.C.8)																

Table 22: Integrated Math I Aligned to Digital PSAT 8/9

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓								
Standard 2. Algebra and Functions	MA.HS.A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. (CCSS: HS.A-CED.A.3)			✓		✓			✓								
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓									
Standard 2. Algebra and Functions	MA.HS.F-IF.A.3	Demonstrate that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. (CCSS: HS.F-IF.A.3)																
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓														

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓								
Standard 4. Geometry	MA.HS.G-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically. (CCSS: HS.G-GPE.B.4)																
Standard 1. Number and Quantity	MA.HS.N-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (CCSS: HS.N-Q.A.1)									✓							
Standard 1. Number and Quantity	MA.HS.N-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. (CCSS: HS.N-Q.A.2)																
Standard 1. Number and Quantity	MA.HS.N-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (CCSS: HS.N-Q.A.3)																
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓											

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓								
Standard 2. Algebra and Functions	MA.HS.A-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (CCSS: HS.A-REI.A.1)	✓		✓	✓	✓		✓	✓								
Standard 2. Algebra and Functions	MA.HS.A-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. (CCSS: HS.A-REI.B.3)	✓				✓				✓							
Standard 2. Algebra and Functions	MA.HS.A-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. (CCSS: HS.A-REI.C.6)				✓												
Standard 2. Algebra and Functions	MA.HS.A-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. (CCSS: HS.A-REI.D.11)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. (CCSS: HS.A-REI.D.12)					✓											
Standard 2. Algebra and Functions	MA.HS.F-IF.A.1	Explain that a function is a correspondence from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. (CCSS: HS.F-IF.A.1)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (CCSS: HS.F-IF.A.2)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓				
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. (CCSS: HS.F-BF.A.2)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓														
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.1	Model data in context with plots on the real number line (dot plots, histograms, and box plots). (CCSS: HS.S-ID.A.1)											✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. (CCSS: HS.S-ID.A.2)											✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). (CCSS: HS.S-ID.A.3)											✓					
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. (CCSS: HS.S-ID.B.5)													✓			

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. (CCSS: HS.S-ID.B.6) a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. (CCSS: HS.S-ID.B.6.a) b. Informally assess the fit of a function by plotting and analyzing residuals. (CCSS: HS.S-ID.B.6.b) c. Fit a linear function for a scatter plot that suggests a linear association. (CCSS: HS.S-ID.B.6.c)												✓				
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.B.7	Distinguish between correlation and causation. (CCSS: HS.S-ID.C.9)																
Standard 3. Data, Statistics, and Probability	MA.HS.S-ID.C.8	Using technology, compute and interpret the correlation coefficient of a linear fit. (CCSS: HS.S-ID.C.8)																
Standard 4. Geometry	MA.HS.G-CO.A.1	State precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. (CCSS: HS.G-CO.A.1)															✓	

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-CO.A.2	Represent transformations in the plane using e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch). (CCSS: HS.G-CO.A.2)																
Standard 4. Geometry	MA.HS.G-CO.A.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself. (CCSS: HS.G-CO.A.3)																
Standard 4. Geometry	MA.HS.G-CO.A.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments. (CCSS: HS.G-CO.A.4)																
Standard 4. Geometry	MA.HS.G-CO.A.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using appropriate tools (e.g., graph paper, tracing paper, or geometry software). Specify a sequence of transformations that will carry a given figure onto another. (CCSS: HS.G-CO.A.5)																
Standard 4. Geometry	MA.HS.G-CO.B.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. (CCSS: HS.G-CO.B.6)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-CO.B.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent. (CCSS: HS.G-CO.B.7)																
Standard 4. Geometry	MA.HS.G-CO.B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. (CCSS: HS.G-CO.B.8)																
Standard 4. Geometry	MA.HS.G-CO.C.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. (CCSS: HS.G-CO.C.11)																
Standard 4. Geometry	MA.HS.G-CO.D.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line. (CCSS: HS.G-CO.D.12)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-GPE.B.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point). (CCSS: HS.G-GPE.B.5)			✓													
Standard 4. Geometry	MA.HS.G-GPE.B.7	Use coordinates and the distance formula to compute perimeters of polygons and areas of triangles and rectangles. (CCSS: HS.G-GPE.B.7)														✓		

Table 23: Integrated Math II Aligned to Digital PSAT 8/9

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 1. Number and Quantity	MA.HS.N-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. (CCSS: HS.N-RN.A.1)																
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.1	Interpret expressions that represent a quantity in terms of its context. (CCSS: HS.A-SSE.A.1) a. Interpret parts of an expression, such as terms, factors, and coefficients. (CCSS: HS.A-SSE.A.1.a) b. Interpret complicated expressions by viewing one or more of their parts as a single entity. (CCSS: HS.A-SSE.A.1.b)	✓	✓	✓	✓	✓			✓								
Standard 2. Algebra and Functions	MA.HS.A-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. (CCSS: HS.A-SSE.A.2)	✓	✓	✓			✓	✓									
Standard 2. Algebra and Functions	MA.HS.A-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (CCSS: HS.A-CED.A.4)							✓									
Standard 2. Algebra and Functions	MA.HS.A.REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. (CCSS: HS.A-REI.C.7)							✓									

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. (CCSS: HS.F-IF.B.5)		✓														
Standard 2. Algebra and Functions	MA.HS.F-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (CCSS: HS.F-IF.C.8) a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. (CCSS: HS.F-IF.C.8.a) b. Use the properties of exponents to interpret expressions for exponential functions. (CCSS: HS.F-IF.C.8.b)								✓								
Standard 2. Algebra and Functions	MA.HS.F-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). (CCSS: HS.F-IF.C.9)		✓						✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.A.1	Write a function that describes a relationship between two quantities. (CCSS: HS.F-BF.A.1) a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (CCSS: HS.F-BF.A.1.a) b. Combine standard function types using arithmetic operations. (CCSS: HS.F-BF.A.1.b)		✓						✓								
Standard 2. Algebra and Functions	MA.HS.F-BF.B.4	Find inverse functions. (CCSS: HS.F-BF.B.4) a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. (CCSS: HS.F-BF.B.4.a)																
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. (CCSS: HS.S-CP.A.4)													✓			
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. (CCSS: HS.S-CP.A.5)																
Standard 4. Geometry	MA.HS.G-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically. (CCSS: HS.G-GPE.B.4)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 1. Number and Quantity	MA.HS.N-CN.A.1	Define complex number i such that $i^2 = -1$, and show that every complex number has the form $a + bi$ where a and b are real numbers. (CCSS: HS.N-CN.A.1)																
Standard 1. Number and Quantity	MA.HS.N-CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers. (CCSS: HS.N-CN.A.2)																
Standard 1. Number and Quantity	MA.HS.N-CN.C.7	Solve quadratic equations with real coefficients that have complex solutions. (CCSS: HS.N-CN.C.7)																
Standard 2. Algebra and Functions	MA.HS.A-APR.A.1	Explain that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. (CCSS: HS.A-APR.A.1)						✓										
Standard 2. Algebra and Functions	MA.HS.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. (CCSS: HS.A-CED.A.1)	✓				✓											
Standard 2. Algebra and Functions	MA.HS.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities and graph equations on coordinate axes with labels and scales. (CCSS: HS.A-CED.A.2)		✓	✓					✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.A.REI.B.4	Solve quadratic equations in one variable. (CCSS: HS.A-REI.B.4) a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. (CCSS: HS.A-REI.B.4.a) b. Solve quadratic equations (e.g., for $x^2 = 49$) by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b. (CCSS: HS.A-REI.B.4.b)							✓										
Standard 2. Algebra and Functions	MA.HS.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. (CCSS: HS.F-IF.B.4)		✓						✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-IF.B.6	Calculate and interpret the average rate of change, presented symbolically or as a table, of a function over a specified interval. Estimate the rate of change from a graph. (CCSS: HS.F-IF.B.6)			✓									✓				
Standard 2. Algebra and Functions	MA.HS.F-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (CCSS: HS.F-IF.C.7) a. Graph linear and quadratic functions and show intercepts, maxima, and minima. (CCSS: HS.F-IF.C.7.a) b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (CCSS: HS.F-IF.C.7.b) c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. (CCSS: HS.F-IF.C.7.c) e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (CCSS: HS.F-IF.C.7.e)		✓						✓								

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 2. Algebra and Functions	MA.HS.F-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $kf(x)$, $f(kx)$, and $f(x+k)$ for specific values of k both positive and negative; find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. (CCSS: HS.F-BF-B.3)		✓														
Standard 2. Algebra and Functions	MA.HS.F-LE.A.3	Use graphs and tables to describe that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. (CCSS: HS.F-LE.A.3)								✓								
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.2	Explain that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. (CCSS: HS.S-CP.A.2)																
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.A.3	Using the conditional probability of A given B as $P(AandB)/P(B)$, interpret the independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. (CCSS: HS.S-CP.A.3)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.B.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model. (CCSS: HS.S-CP.B.6)													✓			
Standard 3. Data, Statistics, and Probability	MA.HS.S-CP.B.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model. (CCSS: HS.S-CP.B.7)													✓			
Standard 4. Geometry	MA.HS.G-CO.C.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints. (CCSS: HS.G-CO.C.9)																
Standard 4. Geometry	MA.HS.G-CO.C.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to $180°$; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point. (CCSS: HS.G-CO.C.10)															✓	

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Standard 4. Geometry	MA.HS.G-CO.C.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. (CCSS: HS.G-CO.C.11)																
Standard 4. Geometry	MA.HS.G-SRT.A.1	Verify experimentally the properties of dilations given by a center and a scale factor. (CCSS: HS.G-SRT.A.1) a. Show that a dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. (CCSS: HS.G-SRT.A.1.a) b. Show that the dilation of a line segment is longer or shorter in the ratio given by the scale factor. (CCSS: HS.G-SRT.A.1.b)														✓		
Standard 4. Geometry	MA.HS.G-SRT.A.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. (CCSS: HS.G-SRT.A.2)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
			Linear equations in one variable	Linear functions	Linear equations in two variables	Systems of two linear equations in two variables	Linear equations in one or two variables	Equivalent expressions	Nonlinear equations in one variable / Systems of equations in two variables	Nonlinear functions	Ratios, rates, proportional relationships, and units	Percentages	One variable data: Distributions and measures of center and spread	Two-variable data: Models and scatterplots	Probability and conditional probability	Area and volume	Lines, angles, and triangles	Right triangles
Standard 4. Geometry	MA.HS.G-SRT.A.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. (CCSS: HS.G-SRT.A.3)																
Standard 4. Geometry	MA.HS.G-SRT.B.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity. (CCSS: HS.G-SRT.B.4)																✓
Standard 4. Geometry	MA.HS.G-SRT.B.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures. (CCSS: HS.G-SRT.B.5)																
Standard 4. Geometry	MA.HS.G-SRT.C.6	Explain that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. (CCSS: HS.G-SRT.C.6)																
Standard 4. Geometry	MA.HS.G-SRT.C.7	Explain and use the relationship between the sine and cosine of complementary angles. (CCSS: HS.G-SRT.C.7)																
Standard 4. Geometry	MA.HS.G-SRT.C.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. (CCSS: HS.G-SRT.C.8)																✓
Standard 4. Geometry	MA.HS.G-C.A.1	Prove that all circles are similar. (CCSS: HS.G-C.A.1)																

CO Standards			Algebra					Advanced Math			Problem Solving and Data Analysis					Geometry and Trigonometry		
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Standard 4. Geometry	MA.HS.G-C.A.2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle. (CCSS: HS.G-C.A.2)																
Standard 4. Geometry	MA.HS.G-C.A.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. (CCSS: HS.G-C.A.3)																
Standard 4. Geometry	MA.HS.G-GPE.A.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. (CCSS: HS.G-GPE.A.1)																
Standard 4. Geometry	MA.HS.G-GMD.A.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments. (CCSS: HS.G-GMD.A.1)																
Standard 4. Geometry	MA.HS.G-GMD.A.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. (CCSS: HS.G-GMD.A.3)														✓		