TRUMBULL PUBLIC SCHOOLS

Trumbull, Connecticut

MATH WORKSHOP II
Grades 11-12
Mathematics Department

2021

Curriculum Writing Team

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CORE VALUES AND BELIEFS

The Trumbull High School community engages in an environment conducive to learning which believes that all students will **read and write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

Math Workshop II is designed for students who have an academic need identified through a variety of testing data. Students focus on organizational and algebraic support systems for CP Algebra II, in which they are enrolled concurrently.

This course supports students by identifying and filling in gaps in prerequisite knowledge necessary for students in CP Algebra II and beyond. It also helps to reinforce the topics of the CP Algebra II curriculum and reflect back upon topics previously learned throughout the year.

Students will be supported in their organizational skills as they relate to CP Algebra II, including, but not limited to, note-taking, study techniques, homework completion, and test preparedness.

COURSE GOALS

Supporting CP Algebra II, Math Workshop II takes a balanced instructional approach to promote the understanding of important mathematical concepts, skills, procedures, and ways of thinking and reasoning.

The following course goals derive from the 2010 Connecticut Core Standards for Mathematical Content.

N-RN   The Real Number System
Extend the properties of exponents to radical exponents. Use properties of rational and irrational numbers.

N-Q   Quantities
Reason quantitatively and use units to solve problems.

A-SSE   Seeing Structure in Expressions

Interpret the structure of expressions. Write expressions in equivalent forms to solve problems.

A-APR   Arithmetic with Polynomials and Rational Expressions
Perform arithmetic operations on polynomials. Understand the relationship between zeros and factors of polynomials.

A-CED   Creating Equations
Create equations that describe numbers or relationships.

A-REI   Reasoning with Equations and Inequalities
Understand solving equations as a process of reasoning and explain the reasoning. Solve equations and inequalities in one variable. Solve systems of equations. Represent and solve equations and inequalities graphically.

F-IF   Interpreting Functions
Understand the concept of a function and use function notation. Interpret functions that arise in applications in terms of the context. Analyze functions using different representations.

F-BF   Building Functions
Build a function that models a relationship between two quantities. Build new functions from existing functions.

F-LE   Linear, Quadratic, and Exponential Models
Construct and compare linear, quadratic, and exponential models and solve problems. Interpret expressions for functions in terms of the situation they model.

S-ID   Interpreting Categorical and Quantitative Data
Summarize, represent, and interpret data on a single count or measurement variable. Summarize, represent, and interpret data on two categorical and quantitative variables. Interpret linear models.

S-IC   Making Inferences and Justifying Conclusions
Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

S-CP   Conditional Probability and the Rules of Probability
Understand independence and conditional probability and use them to interpret data.

The following course goals derive from the 2010 Connecticut Core Standards for Mathematical Practices, which describe varieties of expertise that all teachers of mathematics will develop in their students. These practices rest on important "processes and proficiencies" that have long been valued in mathematics education.

1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.

2. Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved.

Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is.

4. Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.

Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry

software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and the tools' limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, expressing numerical answers with a degree of precision appropriate for the problem context. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects.

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

The following standards derive from the 2016 International Society for Technology in Education Standards.

ISTE Digital Citizen (Standard 2)	Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.
	2a. Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
	2b. Students engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.
	2c. Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.

2d. Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.

| ISTE Knowledge Constructor (Standard 3) | Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others. |

3a. Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

3b. Students evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources.

3c. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

3d. Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

COURSE ENDURING UNDERSTANDINGS

Students will understand that . . .
- strong organizational and study skills enhance learning mathematics.
- number sense and order of operation give rise to solving algebraic equations.
- linear, exponential, quadratic and logarithmic equations can be used to model real-life situations, trigonometric functions, and make informed decisions.
- technology can help them analyze, organize, and display data to support their conclusions.

COURSE ESSENTIAL QUESTIONS

- How can I use strong organizational and study skills, and reflections on previous learning, to enhance learning mathematics?
- How can I use order of operation to solve algebraic equations?
- How does number sense help to assess derived answers in context of given problem?
- How can we take real-life data and model it mathematically?
- How can linear, exponential, quadratic and logarithmic equations help us make informed decisions about the world around us?
- How are trigonometric functions used in real-world applications?
- How can we use graphing calculators to translate real-life data into mathematical models?

COURSE KNOWLEDGE & SKILLS

Students will understand . . .
- the key vocabulary of algebraic mathematics:
  - place value and rounding rules, order of operations, solving multi-step equations including fractions, solving and graphing inequalities, relations of functions, domain and range, slope of lines, deriving and graphing linear equations, modeling real-world data using scatterplots, scatterplots on graphing calculator, solving and graphing systems of linear equations (Unit 1);
  - simplifying monomials expressions using the rules for exponents, adding and subtracting polynomials, factoring polynomials using GCF, grouping method, difference of squares, guess and check, sum and difference of cubes (Unit 2);
  - solving and graphing absolute value and square root equations, graphing special functions. (Unit 3)
  - operations with functions, inverse functions and relations, composite functions. (unit 4);
  - Dividing polynomial expressions, finding roots of real numbers and radical expressions. (unit 5)
  - operations with complex numbers, simplifying complex expressions, Solving quadratic equations by factoring, graphing, completing the square and Quadratic Formula. (Unit 6)
  - graphing quadratic equations by finding vertex and picking points and by putting equation into vertex form to graph, applying various methods to solve real-world applications of quadratic equations (Unit 7);
  - graph linear inequalities and systems of linear inequalities (Unit 8);
  - multiply and divide rational expressions and complex fractions, determine LCM, add and subtract rational expressions, solve rational equations, graph rational equations. (Unit 9);
  - find values of trigonometric functions for acute angles, solving real-world applications of trigonometric functions, change radians to degrees, degrees to radians, identify co-terminal angles in degrees and radians, find values of trigonometric functions for general angles, use reference angles (unit circle) to find values of trigonometric functions. (Unit 10)
  - graphing exponential functions, deriving equation for exponential function, solve exponential functions, evaluate logarithmic expressions, solve logarithmic equations, simplify and evaluate expressions using properties of logarithms, solve logarithmic equations using properties of logarithms, solve real-world applications of logarithmic and exponential problems (Unit 11)

Students will be able to . . .
- recognize place value for numbers and be able to round numbers properly using place value.
- Use order of operations to solve multi-step equations including those with fractions.
- Solve and graph one-variable inequalities.
- Identify domain and range of a function.
- write linear, quadratic, exponential and logarithmic equations from given information.

- rewrite linear equations and inequalities for a given variable.
- use graphing functions of a graphing calculator.
- represent functions using tables, equations, and graphs.
- use function notation.
- find, analyze, and describe the meaning of slope.
- write linear equations.
- find the line of best fit, analyze trend lines, and make scatterplots.
- solve systems of equations by graphing, substitution, and elimination.
- solve systems of inequalities by graphing.
- learn the rules of exponents and use them to simplify expressions.
- learn to factor using GCF, difference of squares, sum and difference of cubes, grouping and guess and check.
- solve quadratic equations by factoring, completing the square and quadratic formula.
- identify the parameters of exponential functions and how they affect the graph of a function.
- apply exponential and logarithmic functions to real-world situations.
- add, subtract, multiply, divide and simplify radicals.
- solve radical equations and rationalize the denominator of radicals.
- add, subtract, and multiply and divide polynomials.
- factor polynomials.
- solve rational equations.
- graph rational equations.
- graph a parabola using the intercepts and vertex as well as vertex form.
- find the 6 trigonometric values from a right triangle.
- use right triangle trigonometry to solve real-world applications.
- convert from radians to degree, degrees to radians.
- identify circular angles.
- find co-terminal angles.
- use properties of logarithms to simplify and solve logarithmic equations.

COURSE SYLLABUS

Course Name
     Math Workshop II

Level
     College-Preparatory

Prerequisites
     Concurrent enrollment in CP Algebra II

Materials Required
     TI-84 graphing calculator

General Description of the Course
     Math Workshop is designed to strengthen students' algebraic skills in preparation for success in Algebra II and future mathematics courses at Trumbull High School. Students will also strengthen and develop problem-solving strategies and organizational and study skills to enhance their mathematics practices.

Assured Assessments
     Formative Assessments:
     Formative assessments can include, but are not limited to:
- Diagnostic assessments
- Notebook checks
- Daily warm-ups
- Exit slips
- Classwork assignments

     Summative Assessments:
- Practice tests
- Midterm review assessments
- Final review assessments

Core Text
Berchie HollidayEdD., et al. *Algebra 2*. New York: Glencoe Mathematics, 2003. Print.

UNIT 1
Introduction, Organization, CP Algebra II Unit 1 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:
- Complete a diagnostic assessment of foundational skills
- Learn organizational skills as they apply to the CP Algebra II course
- Learn skills to help support the CP Algebra II Unit 1: Relations of Functions, Slope and Linear Equations

Unit Essential Questions

- How do I use the notes I've taken in class to prepare for an assessment?
- What are place values and how are they used to round numbers?
- How are fractions added, subtracted, multiplied and divided without a calculator?
- What is order of operations and how is it used to solve multi-step equations?
- How are inequalities solved and graphed?
- What is relations of functions?
- How is slope and linear equations be found?
- What methods can be used to solve a system of linear equations?
- How is the graphing calculator used to create scatter plots and model real world linear data?

Scope and Sequence

- Students will organize their notes and homework so they can better utilize them to prepare for assessments.
- Students will use place values to round numbers correctly.
- Students will simplify expressions containing fractions.
- Students will apply the rules of order of operations to solve multi-step equations.
- Students will solve and graph inequalities with one variable.
- Students will write and graph linear equations.
- Students will solve systems of linear equations using different methods.
- Students will use their graphing calculator to create a scatter plot of data and derive a linear model of the data.

Assured Assessments

Formative Assessment:

Students will complete a diagnostic assessment to measure overall understanding of prerequisite skills. Students will then participate in tasks including, but not limited to, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

Summative Assessment:
A summative practice test will be given in preparation for the Unit 1 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources

<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 1.1, 1.2, 1.3, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5

<u>Supplemental</u>

Time Allotment

- Approximately 35 days, with later reinforcement as needed

UNIT 2
Organization and Study Skills, CP Algebra II Unit 2 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:

- Further develop organizational skills as they apply to the CP Algebra II course
- Learn skills to help support the CP Algebra II Unit 2: Monomials, Polynomials and Factoring

Unit Essential Questions

- How can I build on my success from Unit 1 to better prepare for assessments?
- How do I factor quadratic functions and polynomials?
- How can I use the rules for exponents to multiply and divide monomials and polynomials?

Scope and Sequence

- Students will organize their notes and homework so they can better utilize them to prepare for assessments.
- Students will factor, simplify and evaluate quadratic functions and polynomial expressions.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

Summative Assessment:

A summative practice test will be given in preparation for the Unit 2 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources

Core

- Algebra 2 Glencoe Mathematics
- Sections 5.1, 5.2, 5.4

Time Allotment

- Approximately 8 days, with later reinforcement as need

UNIT 3

Organization and Study Skills, CP Algebra II Unit 3 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Further develop organizational skills and test-taking strategies as they apply to the CP Algebra II course
- Learn skills to help support the CP Algebra II Unit 3: Solving and Graphing Absolute Value and Special Functions

Unit Essential Questions

- How can I build on my success from the previous units to better prepare for assessments?
- How are absolute value equations solved and graphed?
- How are special functions graphed?

Scope and Sequence

- Students will continue to organize their notes and homework so they can better utilize them to prepare for assessments.
- Students will solve and graph absolute value equations.
- Students will graph special functions.

Assured Assessments
Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 3 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 1.4, 2.6, 9.5

Time Allotment

- Approximately 8 days, with later reinforcement as needed

UNIT 4

Independent Study Skills, CP Algebra II Unit 4 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:

- Independently apply the previously learned skills and strategies to the CP Algebra II course
- Learn skills to help support the CP Algebra II Unit 4: Operations with Functions

Unit Essential Questions

- How can I build on my success from the previous units to better prepare for assessments?
- What is a function?
- What are the different ways in which functions may be represented?
- How can functions be added, subtracted, multiplied and divided?
- What is an inverse function and relation?
- How are inverse functions found?
- What is a composite function?
- How is a composite function found?

Scope and Sequence

- Students will independently organize their notes and homework so they can better utilize them to prepare for assessments.
- Students will be introduced to the concept of a function, identify relations and functions, and define the domain and range of a function.
- Students will be introduced to function notation and will perform operations on functions.
- Students will derive inverse functions.
- Students will derive composite functions from given functions.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

Summative Assessment:

A summative practice test will be given in preparation for the Unit 4 end-of-unit assessment in CP Algebra II.

Resources

Core

- Algebra 2 Glencoe Mathematics
- Sections 7.7, 7.8, 7.9

Time Allotment

- Approximately 15 days, with later reinforcement as needed

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UNIT 5
Semester 1 Review, CP Algebra II Unit 5 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:

- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 5: Dividing Polynomials, Roots of Real Numbers and Radical Expressions

Unit Essential Questions

- How can I make connections to material previously learned in CP Algebra II to independently prepare for assessments including the CP Algebra II midterm examination?
- How do I divide a polynomial by a monomial?
- How do I divide polynomial expressions using long and synthetic division?
- How do I find the roots of real numbers with and without a calculator?
- How do I find the roots of radical expressions?

Scope and Sequence

- Following a midterm review, students will independently prepare for the CP Algebra II midterm examination using previously completed notes and study guides.
- Students will divide a polynomial by a monomial using their knowledge of factoring.
- Students will divide polynomials using long division.
- Students will divide polynomials using synthetic division.
- Students will find the roots of real numbers by using their calculator and by means of a factor tree.
- Student will simplify radical expressions.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

Summative Assessment:

A summative practice test will be given in preparation for the Unit 5 end-of-unit assessment in CP Algebra II. This, along with midterm review assessments, will count as 20% of the marking period grade.

Resources

<u>Core</u>

- Algebra 2 Glencoe Mathematics

- Sections 5.3, 5.5, 5.6

Time Allotment

- Approximately 8 days, with later reinforcement as needed

UNIT 6
Organizational and Study Skills, CP Algebra II Unit 6 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 6: Complex Numbers and Solving Quadratic Equations

Unit Essential Questions

- How can I make connections to material previously learned in CP Algebra II?
- What is a complex number?
- How do I perform operations on complex numbers?
- What methods exist to solve quadratic equations?
- What is the quadratic formula and how does it work?
- How do I solve a quadratic equation using completing the square?

Scope and Sequence

- Students will add, subtract, multiply and divide complex numbers.
- Students will use their factoring skills from Unit 2 to factor and solve quadratic equations.
- Students will use the quadratic formula or completing the square to solve non-factorable quadratic equations.

Assured Assessments
Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 6 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
Core
- Algebra 2 Glencoe Mathematics
- Sections 5.9, 6.3, 6.4, 6.5

Time Allotment

- Approximately 15 days, with later reinforcement as needed

UNIT 7
Organization and Study Skills, CP Algebra II Unit 7 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 7: Graphing Quadratic Functions & Quadratic Real-World Applications.

Unit Essential Questions

- How can I make connections to material previously learned in ACP Algebra II?
- How do I find the axis of symmetry and vertex?
- How do I find the x and y-intercepts?
- How do I plot the axis of symmetry, vertex and intercepts?
- How do I use symmetry to complete the graph of a quadratic function?
- How do I use completing the square to put a quadratic equation into vertex form?
- How do I graph a quadratic equation in vertex form?
- What are the key phrases in quadratic word problems that will help me determine how to solve the problem?
- How do I decide if the answer I got makes sense in the context of the problem given?

Scope and Sequence

- Students will use $-\dfrac{b}{2a}$ and $f\left(-\dfrac{b}{2a}\right)$ to find the axis of symmetry, vertex, then plot them on the graph.
- Students will factor the quadratic equation and solve for the x-intercepts, then plot them on the graph.
- Students will find $f(0)$, the y-intercept, then plot that on the graph.
- Students will use symmetry to complete the graph of the quadratic equation.
- Students will apply information learned in Unit 2 to complete the square of a quadratic equation in order to put the equation into vertex form.
- Students will identify the vertex of a quadratic equation from the vertex form and graph the equation.
- Students will read the quadratic word problem, identify key words or phrases, write an equation from the given information; solve the equation to find the answer.
- Students will evaluate the solution to the quadratic word problem to be sure it make sense in the context of the given problem.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments

related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade. Summative Assessment:

A summative practice test will be given in preparation for the Unit 7 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
Core
- Algebra 2 Glencoe Mathematics
- Sections 6.2, 6.3, 6.6

Time Allotment

- Approximately 15 days, with later reinforcement as needed

UNIT 8
Independent Study Skills, CP Algebra II Unit 8 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 8: Graphing Linear Inequalities, Graphing Systems of Linear Inequalities, and Solving Radical Equations

Unit Essential Questions

- How do I graph a linear inequality?
- How do I graph a system of linear inequalities?
- Why do I have to shade the graph of linear inequalities?
- What does this shaded area represent?
- How do I solve a radical equation?
- What is an extraneous solution and why does it matter?

Scope and Sequence

- Students will review graphing of linear equations from Unit 1.
- Students will graph linear inequalities and systems of linear inequalities.
- Students will learn how to shade linear inequalities and why that shading is done.
- Students will evaluate radical equations.
- Students will check their solutions to radical equations to be sure the answers are not extraneous.

Assured Assessments
Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 8 end-of-unit assessment in CP Algebra II. This, along with final review assessments, will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 2.7, 3.3, 5.8

Time Allotment

- Approximately 8 days, with later reinforcement as needed

UNIT 9
Independent Study Skills, CP Algebra II Unit 9 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 9: Multiplying and Dividing Rational Expressions, Graphing Rational Expressions and Solving Rational Equations.

Unit Essential Questions

- How can I use everything I have learned in CP Algebra II to be successful on the final examination?
- How do I apply the rules of exponents from Unit 2 to help me multiply and divide rational expressions?
- How do I apply the factoring skills learned in Unit 2 to help me multiply and divide rational expressions?
- How do I solve a rational equation?
- Why is a common denominator needed to solve a rational equation?
- Why do I have to check the solution of a rational equation?

Scope and Sequence

- Students will review rules for exponents as well as factoring from Unit 2.
- Students will simplify multiplication and division of rational expressions.
- Students will solve rational equations and check their solutions.

Assured Assessments
Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 9 end-of-unit assessment in CP Algebra II. This will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 9.1, 9.3, 9.6

Time Allotment

- Approximately 15 days, with later reinforcement as needed

UNIT 10
Semester 2 Review, CP Algebra II Unit 10 Support and Reinforcement

Unit Goals
At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 10: Right Triangle Trigonometry, Circular Angles and Measures, Trigonometric Functions of General Angles.

Unit Essential Questions

- How can I make connections to material previously learned in CP Algebra II to independently prepare for assessments including the CP Algebra II final examination?
- How do I find values of trigonometric functions for acute angles?
- How do I solve problems involving right triangle?
- How do I solve real-world applications of right triangle trigonometry?
- What is a radian angle measure?
- How do I convert from degree to radians and visa-versa?
- What is a co-terminal angle and how do I find and draw them?
- How do I find values of trigonometric functions for general angles?
- What is a reference angle?
- How do I use reference angles to find values of trigonometric functions?

Scope and Sequence

- Following a final review, students will independently prepare for the CP Algebra II final examination using previously completed notes and study guides.
- Students will learn to evaluate the six trigonometric functions in terms of opposite, adjacent and hypotenuse.
- Students will learn to find sides and angles of right triangles using their calculator.
- Students will learn the ratios of special right triangles and how to apply these ratios.
- Students will read the trigonometric word problem, identify key words or phrases, write an equation from the given information; solve the equation to find the answer.
- Students will assess their solution to determine if it makes sense in the context of the given equation.
- Students will convert angle measures from degrees to radians and radians to degrees.
- Students will identify and draw co-terminal angles.
- Students will determine if co-terminal angles are positive or negative.
- Students will find values of trigonometric functions for general angles on the xy coordinate plane.
- Students will find the reference angle for a circular angle and use the reference angle to find the six trigonometry functions.

Assured Assessments

Formative Assessment:

Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.

Summative Assessment:

A summative practice test will be given in preparation for the Unit 10 end-of-unit assessment in CP Algebra II. This, will count as 20% of the marking period grade.

Resources

Core

- Algebra 2 Glencoe Mathematics
- Sections 13.1, 13.2, 13.3

Time Allotment

- Approximately 15 days, with later reinforcement as needed

UNIT 11
Semester 2 Review, CP Algebra II Unit 11 Support and Reinforcement

Unit Goals

At the completion of this unit, students will:
- Reinforce identified areas of weakness from previous CP Algebra II units
- Learn skills to help support the CP Algebra II Unit 11: Exponential and Logarithmic Functions and Properties of Logarithms.

Unit Essential Questions

- How can I make connections to material previously learned in CP Algebra II to independently prepare for assessments including the CP Algebra II final examination?
- What characterizes exponential growth and decay?
- What are real-world models of exponential growth and decay?
- How do I convert from logarithmic equations to exponential equations and visa-versa?
- Why is a common base needed to solve an exponential equation?
- Why are the rules for exponents (Unit 2) important for exponential equations?
- How do I evaluate a logarithmic expression?
- How do I solve a logarithmic equation?
- What are the properties of logarithms and why do I need them?
- How do I apply the properties of logarithms to solve more complex logarithmic equations?

Scope and Sequence

- Following a final review, students will independently prepare for the CP Algebra II final examination using previously completed notes and study guides.
- Students will graph exponential growth and decay models?
- Students will identify exponential growth and decay from a model and graph.
- Students will read and interpret real-world problems in order to write and solve exponential growth / decay applications.
- Student will convert exponential equations to logarithmic equations and logarithmic equations to exponential equations.
- Student will understand when to convert an equation for the purposes of solving.
- Students will solve logarithmic and exponential equations.
- Students will understand and apply the properties of logarithms to solve more complex logarithmic equations.

Assured Assessments

Formative Assessment:
Students will participate in tasks including, but not limited to, a unit diagnostic assessment, notebook checks, daily warm-ups, exit slips, and/or other formative classwork assessments related to the CP Algebra II curriculum. Skills checks (e.g., diagnostic assessment, notebook

checks, exit slips) will count as 30% of the marking period grade; skills practice (e.g., daily warm-ups, other classwork assignments) will count as 50% of the marking period grade.
Summative Assessment:
A summative practice test will be given in preparation for the Unit 11 end-of-unit assessment in CP Algebra II. This, along with a final exam review assessment will count as 20% of the marking period grade.

Resources
<u>Core</u>
- Algebra 2 Glencoe Mathematics
- Sections 10.1, 10.2, 13.3

Time Allotment

- Approximately 10 days, with later reinforcement as needed

- Following a final review, students will independently prepare for the CP Algebra II final examination using previously completed notes and study guides.

COURSE CREDIT

One-half credit in Mathematics
One class period every other day for a full year

PREREQUISITES

Concurrent enrollment in CP Algebra II

TEXT

- Algebra 2 Glencoe Mathematics

SUPPLEMENTARY MATERIALS/RESOURCES/TECHNOLOGY

Department- and teacher-prepared materials

TI-84 Plus graphing calculators

CURRENT REFERENCES

2010 Connecticut Core Standards for Mathematics
http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

ASSURED STUDENT PERFORMANCE RUBRICS

- Trumbull High School School-Wide Writing Rubric
- Trumbull High School School-Wide Problem-Solving Rubric
- Trumbull High School School-Wide Independent Learning and Thinking Rubric

SCHOOL-WIDE RUBRICS

Rubric 2: Write Effectively

Category/ Weight	Exemplary 4 Student work:	Goal 3 Student work:	Working Toward Goal 2 Student work:	Needs Support 1-0 Student work:
Purpose X_____	• Establishes and maintains a clear purpose • Demonstrates an insightful understanding of audience and task	• Establishes and maintains a purpose • Demonstrates an accurate awareness of audience and task	• Establishes a purpose • Demonstrates an awareness of audience and task	• Does not establish a clear purpose • Demonstrates limited/no awareness of audience and task
Organization X_____	• Reflects sophisticated organization throughout • Demonstrates logical progression of ideas • Maintains a clear focus • Utilizes effective transitions	• Reflects organization throughout • Demonstrates logical progression of ideas • Maintains a focus • Utilizes transitions	• Reflects some organization throughout • Demonstrates logical progression of ideas at times • Maintains a vague focus • May utilize some ineffective transitions	• Reflects little/no organization • Lacks logical progression of ideas • Maintains little/no focus • Utilizes ineffective or no transitions
Content X_____	• Is accurate, explicit, and vivid • Exhibits ideas that are highly developed and enhanced by specific details and examples	• Is accurate and relevant • Exhibits ideas that are developed and supported by details and examples	• May contain some inaccuracies • Exhibits ideas that are partially supported by details and examples	• Is inaccurate and unclear • Exhibits limited/no ideas supported by specific details and examples
Use of Language X_____	• Demonstrates excellent use of language • Demonstrates a highly effective use of standard writing that enhances communication • Contains few or no errors. Errors do not detract from meaning	• Demonstrates competent use of language • Demonstrates effective use of standard writing conventions • Contains few errors. Most errors do not detract from meaning	• Demonstrates use of language • Demonstrates use of standard writing conventions • Contains errors that detract from meaning	• Demonstrates limited competency in use of language • Demonstrates limited use of standard writing conventions • Contains errors that make it difficult to determine meaning

Rubric 3: Problem Solving through Critical Thinking

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Understanding X_____	Student demonstrates clear understanding of the problem and the complexities of the task	Student demonstrates sufficient understanding of the problem and most of the complexities of the task	Student demonstrates some understanding of the problem but requires assistance to complete the task	Student demonstrates limited or no understanding of the fundamental problem after assistance with the task
Research X_____	Student gathers compelling information from multiple sources including digital, print, and interpersonal	Student gathers sufficient information from multiple sources including digital, print, and interpersonal	Student gathers some information from few sources including digital, print, and interpersonal	Student gathers limited or no information
Reasoning and Strategies X_____	Student demonstrates strong critical thinking skills to develop a comprehensive plan integrating multiple strategies	Student demonstrates sufficient critical thinking skills to develop a cohesive plan integrating strategies	Student demonstrates some critical thinking skills to develop a plan integrating some strategies	Student demonstrates limited or no critical thinking skills and no plan
Final Product and/or Presentation X_____	Solution shows deep understanding of the problem and its components. Solution shows extensive use of 21st Century Technology Skills.	Solution shows sufficient understanding of the problem and its components. Solution shows sufficient use of 21st Century Technology Skills.	Solution shows some understanding of the problem and its components. Solution shows some use of 21st Century Technology Skills.	Solution shows limited or no understanding of the problem and its components. Solution shows limited or no use of 21st Century Technology Skills.

Rubric 5: Independent Learners And Thinkers

Category/Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Proposal X_____	Student demonstrates a strong sense of initiative by generating compelling questions, creating uniquely original projects/work.	Student demonstrates initiative by generating appropriate questions, creating original projects/work.	Student demonstrates some initiative by generating questions, creating appropriate projects/work.	Student demonstrates limited or no initiative by generating few questions and creating projects/work.
Independent Research & Development X_____	Student is analytical, insightful, and works independently to reach a solution.	Student is analytical, and works productively to reach a solution.	Student reaches a solution with direction.	Student is unable to reach a solution without consistent assistance.
Presentation of Finished Product X_____	Presentation shows compelling evidence of an independent learner and thinker. Solution shows deep understanding of the problem and its components. Solution shows extensive and appropriate application of 21st Century Skills.	Presentation shows clear evidence of an independent learner and thinker. Solution shows adequate understanding of the problem and its components. Solution shows adequate application of 21st Century Skills.	Presentation shows some evidence of an independent learner and thinker. Solution shows some understanding of the problem and its components. Solution shows some application of 21st Century Skills.	Presentation shows limited or no evidence of an independent learner and thinker. Solution shows limited or no understanding of the problem. Solution shows limited or no application of 21st Century Skills.