

College Readiness Mathematics

Standards Alignment

Unit 1: Exploring the Real Number System through Public Health

Lesson	Standards	
Simplifying Expressions	<ul style="list-style-type: none">• A.NR.5.2.• AFA.DSR.7.8.• AFA.PAR.4.2.• AFM.LR.2.5.• CRM.NR.2.1.• EC.AR.2.3.• EC.AR.2.4.• EC.AR.2.6.• EC.AR.2.8.• HM.LMIR.3.1.• MVC.PAR.2.4.	<p>Using numerical reasoning, show and explain that the sum or product of rational numbers is rational, the sum of a rational number and an irrational number is irrational, and the product of a nonzero rational number and an irrational number is irrational.</p> <p>Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.</p> <p>Investigate the impact of changing the value of the different variables in financial formulas to compare the resulting financial outcomes.</p> <p>Use the method of mathematical induction to prove statements involving the positive integers.</p> <p>Through multi-step/multi-operational problems, perform mathematical operations on real numbers demonstrating fluency using the order of operations.</p> <p>Apply and adapt a variety of appropriate strategies to solve problems.</p> <p>Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.</p>

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Evaluate functions of two independent variables at a point in the plane.

Rational Exponents

- A.NR.5.1.
- AA.FGR.4.1.
- AA.FGR.8.1.
- AA.FGR.8.2.
- CRM.NR.2.3.

Rewrite algebraic and numeric expressions involving radicals.

Rewrite radical expressions as expressions with rational exponents. Extend the properties of integer exponents to rational exponents.

Rewrite simple rational expressions in equivalent forms.

Add, subtract, multiply and divide rational expressions, including problems in context and express rational expressions in irreducible form.

Apply the rules of exponents to simplify numerical expressions, extending the properties of exponents to rational exponents.

Performing Operations in Public Health Contexts

Adding and Subtracting Radicals

- A.NR.5.1.
- AA.FGR.4.1.
- CRM.NR.2.3.
- CRM.NR.2.4.

Rewrite algebraic and numeric expressions involving radicals.

Rewrite radical expressions as expressions with rational exponents. Extend the properties of integer exponents to rational exponents.

Apply the rules of exponents to simplify numerical expressions, extending the properties of exponents to rational exponents.

Perform mathematical operations on real numbers to include numerical radical expressions and complex fractions.

Multiplying Radicals

- A.NR.5.1.
- AA.FGR.4.1.
- CRM.NR.2.3.
- CRM.NR.2.4.

Rewrite algebraic and numeric expressions involving radicals.

Rewrite radical expressions as expressions with rational exponents. Extend the properties of integer exponents to rational exponents.

Apply the rules of exponents to simplify numerical expressions, extending the properties of exponents to rational exponents.

Perform mathematical operations on real numbers to include numerical radical expressions and complex fractions.

Dividing Radicals

- A.NR.5.1.
- AA.FGR.4.1.
- CRM.NR.2.3.
- CRM.NR.2.4.

Rewrite algebraic and numeric expressions involving radicals.

Rewrite radical expressions as expressions with rational exponents. Extend the properties of integer exponents to rational exponents.

Apply the rules of exponents to simplify numerical expressions, extending the properties of exponents to rational exponents.

Perform mathematical operations on real numbers to include numerical radical expressions and complex fractions.

Dimensional Analysis

- A.MM.1.5.

Define appropriate quantities for the purpose of descriptive modeling.

Unit Test

Unit 2: Interpreting Data

Relative Frequencies

- AA.DSR.2.3.
- AFA.DSR.8.8.
- AMDM.DSR.7.8.
- CRM.DSR.6.3.
- EC.AR.2.5.
- EC.AR.2.6.
- EC.AR.2.8.
- G.DSR.11.1.
- G.DSR.11.2.
- G.PR.10.2.
- SR.DSR.4.1.

Distinguish between population distributions, sample data distributions, and sampling distributions. Use sample statistics to make inferences about population parameters based on a random sample from that population and to communicate conclusions using appropriate statistical language.

Use distributions to identify the key features of the data collected.

Use distributions to identify the key features of the data collected.

Summarize categorical data for two categories in two-way frequency tables using relative frequencies in the context of the data.

Monitor and reflect on the process of mathematical problem solving and interpret solutions that arise in engineering contexts.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Construct and summarize categorical data for two categories in two-way frequency tables.

Use categorical data in two-way frequency tables to calculate and interpret probabilities based on the investigation.

Apply and interpret the general Multiplication Rule conceptually to independent events of a sample space, $P(A \text{ and } B) = [P(A)] \times [P(B|A)] = [P(B)] \times [P(A|B)]$ using contingency tables or tree diagrams.

Summarize quantitative or categorical data using tables,

graphical displays, and numerical summary statistics.

Describing and Comparing Data with Dotplots and Stemplots

- A.DSR.10.1.
- AA.DSR.2.5.
- AFA.DSR.7.1.
- AFA.DSR.7.2.
- CRM.DSR.6.2.
- EC.AR.2.5.
- EC.AR.2.6.
- EC.AR.2.8.
- G.DSR.11.1.
- G.DSR.11.2.
- MIG.ARPDM.5.1.
- MIG.ARPDM.5.4.
- SR.DSR.4.1.

Use statistics appropriate to the shape of the data distribution to compare and represent center (median and mean) and variability (interquartile range, standard deviation) of two or more distributions by hand and using technology.

Given a normally distributed population, estimate percentages using the Empirical Rule, z-scores, and technology.

Interpret measures of central tendency (mean, median, mode) and spread (range, interquartile range, variance, standard deviation) to analyze contextualized data sets.

Construct and interpret common data displays (bar graphs, line graphs, stock bar charts, candlestick charts, box and whisker plots, stem and leaf plots, and circle graphs) to recognize and interpret trends.

Calculate, compare, and interpret shape, center, and spread of two or more univariate data sets, accounting for possible effects of extreme data points.

Monitor and reflect on the process of mathematical problem solving and interpret solutions that arise in engineering contexts.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Construct and summarize categorical data for two categories in two-way frequency tables.

Use categorical data in two-way frequency tables to calcu-

late and interpret probabilities based on the investigation.

Use properties of normal distributions to make decisions about optimization and efficiency.

Apply techniques to quality control settings.

Summarize quantitative or categorical data using tables, graphical displays, and numerical summary statistics.

Describing and Comparing Data with Histograms

- A.DSR.10.1.
- AA.DSR.2.5.
- AFA.DSR.7.1.
- AFA.DSR.7.2.
- CRM.DSR.6.2.
- CRM.DSR.6.3.
- EC.AR.2.5.
- EC.AR.2.6.
- EC.AR.2.8.
- MIG.ARPDM.5.1.
- MIG.ARPDM.5.4.
- SR.DSR.4.1.

Use statistics appropriate to the shape of the data distribution to compare and represent center (median and mean) and variability (interquartile range, standard deviation) of two or more distributions by hand and using technology.

Given a normally distributed population, estimate percentages using the Empirical Rule, z-scores, and technology.

Interpret measures of central tendency (mean, median, mode) and spread (range, interquartile range, variance, standard deviation) to analyze contextualized data sets.

Construct and interpret common data displays (bar graphs, line graphs, stock bar charts, candlestick charts, box and whisker plots, stem and leaf plots, and circle graphs) to recognize and interpret trends.

Calculate, compare, and interpret shape, center, and spread of two or more univariate data sets, accounting for possible effects of extreme data points.

Summarize categorical data for two categories in two-way frequency tables using relative frequencies in the context of the data.

Monitor and reflect on the process of mathematical problem solving and interpret solu-

tions that arise in engineering contexts.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Use properties of normal distributions to make decisions about optimization and efficiency.

Apply techniques to quality control settings.

Summarize quantitative or categorical data using tables, graphical displays, and numerical summary statistics.

Measures of Center and Location

- A.DSR.10.1.
- A.DSR.10.2.
- AA.DSR.2.3.
- AA.DSR.2.5.
- AFA.DSR.7.1.
- AFA.DSR.7.2.
- AFA.DSR.8.3.
- AFA.DSR.8.8.
- AMDM.DSR.7.1.
- AMDM.DSR.7.3.
- AMDM.DSR.7.8.
- CRM.DSR.6.2.
- EC.AR.2.5.
- EC.AR.2.6.
- EC.AR.2.8.
- MIG.ARPDM.5.1.
- MIG.ARPDM.5.4.
- SR.DSR.3.2.

Use statistics appropriate to the shape of the data distribution to compare and represent center (median and mean) and variability (interquartile range, standard deviation) of two or more distributions by hand and using technology.

Interpret differences in shape, center, and variability of the distributions based on the investigation, accounting for possible effects of extreme data points (outliers).

Distinguish between population distributions, sample data distributions, and sampling distributions. Use sample statistics to make inferences about population parameters based on a random sample from that population and to communicate conclusions using appropriate statistical language.

Given a normally distributed population, estimate percentages using the Empirical Rule, z-scores, and technology.

Interpret measures of central tendency (mean, median, mode) and spread (range,

- SR.DSR.3.3.
- SR.DSR.3.7.
- SR.DSR.5.2.

interquartile range, variance, standard deviation) to analyze contextualized data sets.

Construct and interpret common data displays (bar graphs, line graphs, stock bar charts, candlestick charts, box and whisker plots, stem and leaf plots, and circle graphs) to recognize and interpret trends.

Create a statistical study using sound methodology to answer statistical questions and to solve the real-life problem.

Use distributions to identify the key features of the data collected.

Apply statistical methods to design, conduct, and analyze statistical studies. Identify a contextual, real-life problem that can be answered using investigative research.

Create a statistical study using sound methodology to answer statistical investigative questions and to solve the real-life problem.

Use distributions to identify the key features of the data collected.

Calculate, compare, and interpret shape, center, and spread of two or more univariate data sets, accounting for possible effects of extreme data points.

Monitor and reflect on the process of mathematical problem solving and interpret solutions that arise in engineering contexts.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Use properties of normal distributions to make decisions

about optimization and efficiency.

Apply techniques to quality control settings.

Distinguish between surveys, observational studies, and experiments.

Design sample surveys, experiments, and observational studies using accepted practices.

Identify when data can be generalized to a target population.

Interpret the impact of outliers, missing values, or erroneous values on the results.

Measures of Variability

- A.DSR.10.1.
- AFA.DSR.7.1.
- AFA.DSR.7.2.
- CRM.DSR.6.2.
- EC.AR.2.5.
- EC.AR.2.6.
- EC.AR.2.8.

Use statistics appropriate to the shape of the data distribution to compare and represent center (median and mean) and variability (interquartile range, standard deviation) of two or more distributions by hand and using technology.

Interpret measures of central tendency (mean, median, mode) and spread (range, interquartile range, variance, standard deviation) to analyze contextualized data sets.

Construct and interpret common data displays (bar graphs, line graphs, stock bar charts, candlestick charts, box and whisker plots, stem and leaf plots, and circle graphs) to recognize and interpret trends.

Calculate, compare, and interpret shape, center, and spread of two or more univariate data sets, accounting for possible effects of extreme data points.

Monitor and reflect on the process of mathematical problem solving and interpret solutions that arise in engineering contexts.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Boxplots and Outliers

- A.DSR.10.1.
- AA.DSR.2.3.
- AFA.DSR.7.1.
- AFA.DSR.7.2.
- AFA.DSR.8.8.
- AMDM.DSR.7.8.
- AMDM.QPR.2.1.
- CRM.DSR.6.2.
- EC.AR.2.5.
- EC.AR.2.6.
- EC.AR.2.8.
- SR.DSR.4.2.
- SR.DSR.5.5.

Use statistics appropriate to the shape of the data distribution to compare and represent center (median and mean) and variability (interquartile range, standard deviation) of two or more distributions by hand and using technology.

Distinguish between population distributions, sample data distributions, and sampling distributions. Use sample statistics to make inferences about population parameters based on a random sample from that population and to communicate conclusions using appropriate statistical language.

Interpret measures of central tendency (mean, median, mode) and spread (range, interquartile range, variance, standard deviation) to analyze contextualized data sets.

Construct and interpret common data displays (bar graphs, line graphs, stock bar charts, candlestick charts, box and whisker plots, stem and leaf plots, and circle graphs) to recognize and interpret trends.

Use distributions to identify the key features of the data collected.

Use distributions to identify the key features of the data collected.

Apply proportions, ratios, rates, and percentages to various settings, including business, media, and consumerism.

Calculate, compare, and interpret shape, center, and spread

of two or more univariate data sets, accounting for possible effects of extreme data points.

Monitor and reflect on the process of mathematical problem solving and interpret solutions that arise in engineering contexts.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Summarize and describe relationships among multiple variables.

Explain the impact of multiple variables on one another.

The Relationship between Two Quantitative Variables

- A.DSR.10.3.
- A.DSR.10.5.
- AFA.DSR.7.3.
- AFA.DSR.7.4.
- CRM.DSR.6.4.
- EC.AR.2.3.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- SR.DSR.4.1.
- SR.DSR.4.5.

Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

Calculate the line of best fit and interpret the correlation coefficient, r , of a linear fit using technology. Use r to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.

Construct and interpret scatterplots to recognize and interpret trends.

Use technology to find, interpret, and graph linear, quadratic, and exponential regression equations to make predictions about the corresponding context.

Represent bivariate data on a scatter plot and describe how the variables are related in terms of strength and direction.

Apply and adapt a variety of appropriate strategies to solve problems.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Summarize quantitative or categorical data using tables, graphical displays, and numerical summary statistics.

Describe the relationship between two quantitative variables by interpreting correlation (r) and a least-square regression line (using technology).

Correlation

- A.DSR.10.3.
- A.DSR.10.5.
- A.DSR.10.7.
- AFA.DSR.7.3.
- AFA.DSR.7.4.
- AFA.DSR.7.6.
- CRM.DSR.6.4.
- CRM.DSR.6.7.
- EC.AR.2.3.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- SR.DSR.4.1.
- SR.DSR.4.2.
- SR.DSR.4.5.
- SR.DSR.5.5.

Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

Calculate the line of best fit and interpret the correlation coefficient, r , of a linear fit using technology. Use r to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.

Distinguish between correlation and causation.

Construct and interpret scatterplots to recognize and interpret trends.

Use technology to find, interpret, and graph linear, quadratic, and exponential regression equations to make predictions about the corresponding context.

Distinguish between causation and correlation for bivariate data.

Represent bivariate data on a scatter plot and describe how the variables are related in terms of strength and direction.

Distinguish between correlation and causation, and interpolation and extrapolation.

Apply and adapt a variety of appropriate strategies to solve problems.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Summarize quantitative or categorical data using tables, graphical displays, and numerical summary statistics.

Summarize and describe relationships among multiple variables.

Describe the relationship between two quantitative variables by interpreting correlation (r) and a least-square regression line (using technology).

Explain the impact of multiple variables on one another.

Making Predictions from a Least-Squares Regression Line

- A.DSR.10.3.
- A.DSR.10.4.
- A.DSR.10.5.
- A.DSR.10.6.
- A.FGR.2.2.
- A.FGR.7.7.

Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

Interpret the slope (predicted rate of change) and the intercept (constant term) of a linear model based on the investigation of the data.

- A.GSR.3.1.
- A.GSR.3.2.
- AFA.DSR.7.3.
- AFA.DSR.7.4.
- AFA.DSR.7.5.
- CRM.DSR.6.4.
- CRM.DSR.6.5.
- CRM.DSR.6.6.
- CRM.DSR.6.7.
- CRM.GSR.5.1.
- EC.AR.2.3.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.PAR.7.12.
- SR.DSR.4.1.
- SR.DSR.4.5.

Calculate the line of best fit and interpret the correlation coefficient, r , of a linear fit using technology. Use r to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.

Decide which type of function is most appropriate by observing graphed data.

Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation.

Estimate, calculate, and interpret the average rate of change of a quadratic function and make comparisons to the average rate of change of linear functions.

Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

Construct and interpret scatterplots to recognize and interpret trends.

Use technology to find, interpret, and graph linear, quadratic, and exponential regression equations to make predictions about the corresponding context.

Use technology to determine the correlation coefficient of linear, quadratic, and exponential regression curves.

Represent bivariate data on a scatter plot and describe how the variables are related in terms of strength and direction.

Interpret the slope (rate of change) and the intercept (con-

stant term) of a linear model in the context of the data.

Compute using technology and interpret the correlation coefficient "r" of a linear fit.

Distinguish between correlation and causation, and interpolation and extrapolation.

Use the distance formula, midpoint formula or slope to verify simple geometric properties.

Apply and adapt a variety of appropriate strategies to solve problems.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Apply the method of least squares to find the line or parabola of best fit to approximate data in context.

Summarize quantitative or categorical data using tables, graphical displays, and numerical summary statistics.

Describe the relationship between two quantitative variables by interpreting correlation (r) and a least-square regression line (using technology).

Calculating the Least-Squares Regression Line

- A.DSR.10.3.
- A.DSR.10.4.
- A.DSR.10.5.
- A.DSR.10.6.
- A.FGR.2.2.
- A.FGR.7.7.

Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

Interpret the slope (predicted rate of change) and the intercept (constant term) of a linear model based on the investigation of the data.

- A.GSR.3.1.
- A.GSR.3.2.
- AFA.DSR.7.3.
- AFA.DSR.7.4.
- AFA.DSR.7.5.
- CRM.DSR.6.4.
- CRM.DSR.6.5.
- CRM.DSR.6.6.
- CRM.DSR.6.7.
- CRM.GSR.5.1.
- EC.AR.2.3.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.PAR.7.12.
- SR.DSR.4.1.
- SR.DSR.4.5.

Calculate the line of best fit and interpret the correlation coefficient, r , of a linear fit using technology. Use r to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.

Decide which type of function is most appropriate by observing graphed data.

Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation.

Estimate, calculate, and interpret the average rate of change of a quadratic function and make comparisons to the average rate of change of linear functions.

Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

Construct and interpret scatterplots to recognize and interpret trends.

Use technology to find, interpret, and graph linear, quadratic, and exponential regression equations to make predictions about the corresponding context.

Use technology to determine the correlation coefficient of linear, quadratic, and exponential regression curves.

Represent bivariate data on a scatter plot and describe how the variables are related in terms of strength and direction.

Interpret the slope (rate of change) and the intercept (con-

stant term) of a linear model in the context of the data.

Compute using technology and interpret the correlation coefficient "r" of a linear fit.

Distinguish between correlation and causation, and interpolation and extrapolation.

Use the distance formula, midpoint formula or slope to verify simple geometric properties.

Apply and adapt a variety of appropriate strategies to solve problems.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Apply the method of least squares to find the line or parabola of best fit to approximate data in context.

Summarize quantitative or categorical data using tables, graphical displays, and numerical summary statistics.

Describe the relationship between two quantitative variables by interpreting correlation (r) and a least-square regression line (using technology).

R-squared and s

- A.DSR.10.3.
- A.DSR.10.4.
- A.DSR.10.5.
- A.DSR.10.6.
- A.FGR.2.2.
- A.FGR.7.7.

Represent data on two quantitative variables on a scatter plot and describe how the variables are related.

Interpret the slope (predicted rate of change) and the intercept (constant term) of a linear model based on the investigation of the data.

- A.GSR.3.1.
- A.GSR.3.2.
- AFA.DSR.7.3.
- AFA.DSR.7.4.
- AFA.DSR.7.5.
- CRM.DSR.6.4.
- CRM.DSR.6.5.
- CRM.DSR.6.6.
- CRM.DSR.6.7.
- CRM.GSR.5.1.
- EC.AR.2.3.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.PAR.7.12.
- SR.DSR.4.1.
- SR.DSR.4.5.

Calculate the line of best fit and interpret the correlation coefficient, r , of a linear fit using technology. Use r to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.

Decide which type of function is most appropriate by observing graphed data.

Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation.

Estimate, calculate, and interpret the average rate of change of a quadratic function and make comparisons to the average rate of change of linear functions.

Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

Construct and interpret scatterplots to recognize and interpret trends.

Use technology to find, interpret, and graph linear, quadratic, and exponential regression equations to make predictions about the corresponding context.

Use technology to determine the correlation coefficient of linear, quadratic, and exponential regression curves.

Represent bivariate data on a scatter plot and describe how the variables are related in terms of strength and direction.

Interpret the slope (rate of change) and the intercept (con-

stant term) of a linear model in the context of the data.

Compute using technology and interpret the correlation coefficient "r" of a linear fit.

Distinguish between correlation and causation, and interpolation and extrapolation.

Use the distance formula, midpoint formula or slope to verify simple geometric properties.

Apply and adapt a variety of appropriate strategies to solve problems.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Apply the method of least squares to find the line or parabola of best fit to approximate data in context.

Summarize quantitative or categorical data using tables, graphical displays, and numerical summary statistics.

Describe the relationship between two quantitative variables by interpreting correlation (r) and a least-square regression line (using technology).

Unit Test

Unit 3: Calculating Probabilities of Compound Events

Lesson	Standards	
Introduction to Probability	• AFA.DSR.8.5.	Recognize that random selection from a population plays a

- AFA.DSR.8.6.
- AMDM.DSR.7.5.
- AMDM.DSR.7.6.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- G.PR.10.2.
- G.PR.10.6.
- MIG.ARPDM.5.2.
- MIG.ARPDM.6.1.
- MIG.ARPDM.8.1.
- MIG.ARPDM.8.2.
- MIG.ARPDM.8.3.
- SR.DSR.4.6.

different role than random assignment in an experiment.

Incorporate random designs in data collection.

Recognize that random selection from a population plays a different role than random assignment in an experiment.

Incorporate random designs in data collection.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Apply and interpret the general Multiplication Rule conceptually to independent events of a sample space, $P(A \text{ and } B) = [P(A)] \times [P(B|A)] = [P(B)] \times [P(A|B)]$ using contingency tables or tree diagrams.

Develop a probability distribution for variables of interest using theoretical and empirical (observed) probabilities and calculate and interpret the expected value.

Calculate, analyze and interpret theoretical and empirical probabilities using standardized and non-standardized data.

Calculate theoretical and empirical probabilities using standardized and non-standardized data.

Use technology to simulate a real-world situation.

Analyze, evaluate, and interpret results of simulations.

Examine alternate decisions in response to contextual changes of simulations.

Use simulations to investigate associations between two categorical variables and to compare groups.

Probability Rules

- AFA.DSR.7.8.
- AFA.DSR.8.5.
- AFA.DSR.8.6.
- AFM.AQR.6.2.
- AMDM.DSR.7.5.
- AMDM.DSR.7.6.
- AMDM.PR.5.1.
- AMDM.PR.6.3.
- CRM.DSR.6.8.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- G.PR.10.1.
- G.PR.10.2.
- MIG.ARPDM.8.1.
- MIG.ARPDM.8.2.
- MIG.ARPDM.8.3.
- MIG.PR.7.3.
- SR.DSR.4.6.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Recognize that random selection from a population plays a different role than random assignment in an experiment.

Incorporate random designs in data collection.

Apply the axioms of probability to determine the probability of dependent and independent events, including use of the multiplication rule for independent events.

Recognize that random selection from a population plays a different role than random assignment in an experiment.

Incorporate random designs in data collection.

Determine conditional probabilities and probabilities of compound events to make decisions in problem situations.

Construct a mathematical model of probabilistic situations to make mathematical assumptions.

Describe categories of events as subsets of a sample space using unions, intersections, or complements of other events.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Describe categories of events as subsets of a sample space using unions, intersections, or complements of other events. Apply the Addition Rule conceptually, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answers in context.

Apply and interpret the general Multiplication Rule conceptually to independent events of a sample space, $P(A \text{ and } B) = [P(A)] \times [P(B|A)] = [P(B)] \times [P(A|B)]$ using contingency tables or tree diagrams.

Use technology to simulate a real-world situation.

Analyze, evaluate, and interpret results of simulations.

Examine alternate decisions in response to contextual changes of simulations.

Apply queuing theory

Use simulations to investigate associations between two categorical variables and to compare groups.

Applying Probability Rules

- A.FGR.2.3.
- AFA.DSR.7.8.
- AFM.AQR.6.1.

Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the do-

- AFM.AQR.6.2.
- AMDM.PR.5.1.
- CRM.DSR.6.3.
- CRM.DSR.6.8.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- G.DSR.11.1.
- G.DSR.11.2.
- G.PR.10.1.
- G.PR.10.2.

main and range of linear functions.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Use the addition rule to count the number of outcomes in a disjoint set of sample spaces. Use the principle of inclusion-exclusion to count the number of outcomes in the union of sample spaces.

Apply the axioms of probability to determine the probability of dependent and independent events, including use of the multiplication rule for independent events.

Determine conditional probabilities and probabilities of compound events to make decisions in problem situations.

Summarize categorical data for two categories in two-way frequency tables using relative frequencies in the context of the data.

Describe categories of events as subsets of a sample space using unions, intersections, or complements of other events.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Construct and summarize categorical data for two categories in two-way frequency tables.

Use categorical data in two-way frequency tables to calculate and interpret probabilities based on the investigation.

Describe categories of events as subsets of a sample space using unions, intersections, or complements of other events. Apply the Addition Rule conceptually, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answers in context.

Apply and interpret the general Multiplication Rule conceptually to independent events of a sample space, $P(A \text{ and } B) = [P(A)] \times [P(B|A)] = [P(B)] \times [P(A|B)]$ using contingency tables or tree diagrams.

Conditional Probabilities

- A.FGR.2.3.
- AFA.DSR.7.8.
- AFM.AQR.6.2.
- AFM.AQR.6.4.
- AMDM.PR.5.1.
- CRM.DSR.6.10.
- CRM.DSR.6.9.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- G.PR.10.2.
- G.PR.10.3.

Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the domain and range of linear functions.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1), p(2), p(3), \dots, p(n-1), p(n)$.

Apply the axioms of probability to determine the probability of dependent and independent events, including use of the multiplication rule for independent events.

Apply Bayes' Theorem to determine conditional probability.

Determine conditional probabilities and probabilities of compound events to make decisions in problem situations.

Calculate the conditional probability of A given B.

Use the two-way frequency table to calculate conditional probabilities.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Apply and interpret the general Multiplication Rule conceptually to independent events of a sample space, $P(A \text{ and } B) = [P(A)] \times [P(B|A)] = [P(B)] \times [P(A|B)]$ using contingency tables or tree diagrams.

Use conditional probability to interpret risk in terms of decision-making and investigate questions such as those involving false positives or false negatives from screening tests.

Unit Test

Unit 4: Two- and Three-Dimensional Geometry

Lesson	Standards	
Application of Distance, Midpoint, and Slope		
Figures in the Coordinate Plane	<ul style="list-style-type: none">• A.GSR.3.1.• AFM.LR.2.2.• AMDM.GSR.10.1.• CRM.GSR.5.2.	Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

- G.GSR.4.1.
- G.GSR.4.4.
- G.GSR.5.4.
- HM.LMIR.3.2.
- HM.LMIR.4.4.
- HM.LMIR.6.3.
- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.
- LACS.GSR.5.5.

Prove statements directly from definitions and previously proved statements.

Create and use two-dimensional and three-dimensional representations to model authentic situations.

Use coordinates to compute perimeters of polygons, circumference of circles and areas of triangles, rectangles and circles.

Use the undefined notions of point, line, line segment, plane, distance along a line segment, and distance around a circular arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Prove and apply theorems about lines and angles to solve problems.

Construct formal proofs to justify and apply theorems about triangles.

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle (Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Find the area of a polygon given its coordinates using matrices; find the area of the image of a polygon after a transformation.

Area of Triangles and Parallelograms

- A.GSR.3.1.
- A.GSR.3.2.
- AFA.GSR.6.1.
- CRM.GSR.5.1.
- CRM.GSR.5.2.
- G.GSR.4.1.
- HM.LMIR.3.2.
- HM.LMIR.4.4.
- HM.LMIR.6.3.
- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.
- LACS.GSR.5.5.

Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

Apply concepts of area, volume, and scale factors to a variety of real-world financial applications.

Use the distance formula, midpoint formula or slope to verify simple geometric properties.

Use coordinates to compute perimeters of polygons, circumference of circles and areas of triangles, rectangles and circles.

Use the undefined notions of point, line, line segment, plane, distance along a line segment, and distance around a circular arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle (Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Find the area of a polygon given its coordinates using matrices; find the area of the image of a polygon after a transformation.

Circumference and Arc Length

- AFA.GSR.6.3.
- CRM.GSR.5.2.
- G.GSR.4.1.
- G.GSR.7.1.
- G.GSR.7.2.
- G.GSR.8.1.
- G.GSR.8.2.
- HM.LMIR.3.2.
- HM.LMIR.4.4.
- HM.LMIR.6.3.
- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.
- PC.FGR.3.1.

Use sectors and central angles of a circle to depict proportional categories on a pie chart when given categorical information.

Use coordinates to compute perimeters of polygons, circumference of circles and areas of triangles, rectangles and circles.

Use the undefined notions of point, line, line segment, plane, distance along a line segment, and distance around a circular arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Explore and interpret a radian as the ratio of the arc length to the radius of a circle.

Explore and explain the relationship between radian measures and degree measures and convert fluently between degree and radian measures.

Identify and apply angle relationships formed by chords, tangents, secants and radii with circles.

Using similarity, derive the fact that the length of the arc (arc length) intercepted by an angle is proportional to the radius; derive the formula for the area of a sector. Solve mathematically applicable problems involving applications of arc length and area of sector.

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle (Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Use the concept of a radian as the ratio of the arc length to the radius of a circle to establish the existence of 2π radians in one revolution.

Area of a Circle and a Sector

- A.GSR.3.1.
- AFA.GSR.6.1.
- AFA.GSR.6.3.
- CRM.GSR.5.2.
- G.GSR.4.1.
- G.GSR.7.1.
- G.GSR.7.2.
- G.GSR.8.1.
- G.GSR.8.2.
- HM.LMIR.3.2.
- HM.LMIR.4.4.
- HM.LMIR.6.3.

Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Apply concepts of area, volume, and scale factors to a variety of real-world financial applications.

Use sectors and central angles of a circle to depict proportional categories on a pie chart when given categorical information.

Use coordinates to compute perimeters of polygons, circumference of circles and areas of triangles, rectangles and circles.

Use the undefined notions of point, line, line segment, plane, distance along a line segment, and distance around a circular

- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.
- PC.FGR.3.1.

arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Explore and interpret a radian as the ratio of the arc length to the radius of a circle.

Explore and explain the relationship between radian measures and degree measures and convert fluently between degree and radian measures.

Identify and apply angle relationships formed by chords, tangents, secants and radii with circles.

Using similarity, derive the fact that the length of the arc (arc length) intercepted by an angle is proportional to the radius; derive the formula for the area of a sector. Solve mathematically applicable problems involving applications of arc length and area of sector.

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle (Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Use the concept of a radian as the ratio of the arc length to the

radius of a circle to establish the existence of 2π radians in one revolution.

Volume of Cylinders, Cones, and Spheres

- AFA.GSR.6.1.
- CRM.GSR.5.4.
- EC.AR.2.1.
- EC.AR.2.10.
- EC.AR.2.11.
- EC.AR.2.12.
- EC.AR.2.14.
- EC.AR.2.2.
- EC.AR.2.5.
- EC.AR.2.7.
- G.GSR.4.1.
- G.GSR.9.1.
- G.GSR.9.2.
- G.GSR.9.3.
- HM.LMIR.3.2.
- HM.LMIR.4.4.
- HM.LMIR.6.3.
- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.

Apply concepts of area, volume, and scale factors to a variety of real-world financial applications.

Use formulas for finding the volume and surface area of spheres, right and oblique prisms, cylinders, pyramids, and cones.

Build new mathematical knowledge through problem solving that involves the engineering design process.

Present a technical design, using computer-generated model, for an assigned design project utilizing the appropriate scientific units (US standards and SI units).

Use connections among mathematics, technology, and engineering in contextual situations.

Develop vocabulary and communication skills by reading materials associated with engineering and technology education.

Explain the impact of key persons and historical events and their impact on engineering and society.

Solve problems that arise in mathematics and in engineering contexts.

Monitor and reflect on the process of mathematical problem solving and interpret solutions that arise in engineering contexts.

Select, apply, and translate among mathematical representations to solve problems that arise in engineering contexts.

Use the undefined notions of point, line, line segment, plane, distance along a line segment,

and distance around a circular arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Use volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems including right and oblique solids.

Use geometric shapes, their measures, and their properties to describe objects and approximate volumes.

Apply concepts of density based on area and volume in modeling situations

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle (Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Surface Area

- A.GSR.3.1.
- CRM.GSR.5.4.
- G.GSR.4.1.
- HM.LMIR.3.2.
- HM.LMIR.4.4.

Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

- HM.LMIR.6.3.
- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.

Use formulas for finding the volume and surface area of spheres, right and oblique prisms, cylinders, pyramids, and cones.

Use the undefined notions of point, line, line segment, plane, distance along a line segment, and distance around a circular arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle (Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Application of Volume and Surface Area

Unit Test

Unit 5: Right-Angle Trigonometry

Lesson

Standards

Right Triangle Trigonometry

- AFA.GSR.6.4.

Solve problems using the Pythagorean Theorem and

- AFA.NR.2.1.
- AMDM.GSR.10.2.
- CRM.GSR.5.5.
- G.GSR.6.2.
- G.GSR.6.3.
- PC.FGR.3.3.
- PC.FGR.3.5.
- PC.FGR.3.8.

trigonometric functions and their inverses in context.

Use fractions, decimals, percents, and ratios to solve problems related to budgets, income tax rates, payroll deductions, pie charts, percent yield, sales tax, percent populations, rent increase, cost savings, debt-to-income ratios, stock splits, floor plans and scale models, trigonometric calculations, banking services, and other business and financial applications.

Solve problems involving inaccessible distances using basic trigonometric principles including extensions of right triangle trigonometry.

Apply the Pythagorean Theorem and trigonometric ratios to solve problems involving right triangles.

Explain and use the relationship between the sine and cosine of complementary angles.

Use trigonometric ratios and the Pythagorean Theorem to solve for sides and angles of right triangles in applied problems.

Define the six trigonometric ratios in terms of x , y , and r using the unit circle centered at the origin of the coordinate plane. Interpret radian measures of angles as a rotation both counterclockwise and clockwise around the unit circle.

Determine the value(s) of trigonometric functions for a set of given conditions.

Restrict the domain of a trigonometric function to create an invertible function and graph the inverse function. Evaluate inverse trigonometric expressions.

- AFA.NR.2.1.
- AMDM.GSR.10.2.
- CRM.GSR.5.5.
- G.GSR.4.1.
- G.GSR.5.2.
- G.GSR.5.3.
- G.GSR.5.4.
- G.GSR.6.1.
- G.GSR.6.2.
- G.GSR.6.3.
- HM.LMIR.3.2.
- HM.LMIR.4.4.
- HM.LMIR.6.3.
- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.
- PC.FGR.3.3.
- PC.FGR.3.5.

Solve problems using the Pythagorean Theorem and trigonometric functions and their inverses in context.

Use fractions, decimals, percents, and ratios to solve problems related to budgets, income tax rates, payroll deductions, pie charts, percent yield, sales tax, percent populations, rent increase, cost savings, debt-to-income ratios, stock splits, floor plans and scale models, trigonometric calculations, banking services, and other business and financial applications.

Solve problems involving inaccessible distances using basic trigonometric principles including extensions of right triangle trigonometry.

Apply the Pythagorean Theorem and trigonometric ratios to solve problems involving right triangles.

Use the undefined notions of point, line, line segment, plane, distance along a line segment, and distance around a circular arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Given two figures, use and apply the definition of similarity in terms of similarity transformations.

Use the properties of similarity transformations to establish criterion for two triangles to be similar. Use similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Construct formal proofs to justify and apply theorems about triangles.

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.

Explain and use the relationship between the sine and cosine of complementary angles.

Use trigonometric ratios and the Pythagorean Theorem to solve for sides and angles of right triangles in applied problems.

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle (Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Define the six trigonometric ratios in terms of x , y , and r using the unit circle centered at the origin of the coordinate plane. Interpret radian measures of angles as a rotation both counterclockwise and clockwise around the unit circle.

Determine the value(s) of trigonometric functions for a set of given conditions.

Solving for Side Lengths of Right Triangles

- AFA.GSR.6.4.
- AFA.NR.2.1.

Solve problems using the Pythagorean Theorem and trigonometric functions and their inverses in context.

- AMDM.GSR.10.2.
- CRM.GSR.5.5.
- G.GSR.4.1.
- G.GSR.4.5.
- G.GSR.5.4.
- G.GSR.6.2.
- G.GSR.6.3.
- HM.LMIR.3.2.
- HM.LMIR.4.4.
- HM.LMIR.6.3.
- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.
- PC.FGR.3.3.
- PC.FGR.3.5.

Use fractions, decimals, percents, and ratios to solve problems related to budgets, income tax rates, payroll deductions, pie charts, percent yield, sales tax, percent populations, rent increase, cost savings, debt-to-income ratios, stock splits, floor plans and scale models, trigonometric calculations, banking services, and other business and financial applications.

Solve problems involving inaccessible distances using basic trigonometric principles including extensions of right triangle trigonometry.

Apply the Pythagorean Theorem and trigonometric ratios to solve problems involving right triangles.

Use the undefined notions of point, line, line segment, plane, distance along a line segment, and distance around a circular arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Use geometric reasoning to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

Construct formal proofs to justify and apply theorems about triangles.

Explain and use the relationship between the sine and cosine of complementary angles.

Use trigonometric ratios and the Pythagorean Theorem to solve for sides and angles of right triangles in applied problems.

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle (Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Define the six trigonometric ratios in terms of x , y , and r using the unit circle centered at the origin of the coordinate plane. Interpret radian measures of angles as a rotation both counterclockwise and clockwise around the unit circle.

Determine the value(s) of trigonometric functions for a set of given conditions.

Solving for Angle Measures of Right Triangles

- AFA.GSR.6.4.
- AFA.NR.2.1.
- AMDM.GSR.10.2.
- CRM.GSR.5.5.
- G.GSR.4.1.
- G.GSR.4.5.
- G.GSR.5.4.
- G.GSR.6.2.
- G.GSR.6.3.
- HM.LMIR.3.2.

Solve problems using the Pythagorean Theorem and trigonometric functions and their inverses in context.

Use fractions, decimals, percents, and ratios to solve problems related to budgets, income tax rates, payroll deductions, pie charts, percent yield, sales tax, percent populations, rent increase, cost savings, debt-to-income ratios, stock splits, floor plans and scale models, trigonometric calculations, banking services, and other business and financial applications.

- HM.LMIR.4.4.
- HM.LMIR.6.3.
- HM.LMIR.6.4.
- HM.LMIR.6.5.
- HM.LMIR.6.6.
- PC.FGR.3.3.
- PC.FGR.3.5.
- PC.FGR.3.8.

Solve problems involving inaccessible distances using basic trigonometric principles including extensions of right triangle trigonometry.

Apply the Pythagorean Theorem and trigonometric ratios to solve problems involving right triangles.

Use the undefined notions of point, line, line segment, plane, distance along a line segment, and distance around a circular arc to develop and use precise definitions and symbolic notations to prove theorems and solve geometric problems.

Use geometric reasoning to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

Construct formal proofs to justify and apply theorems about triangles.

Explain and use the relationship between the sine and cosine of complementary angles.

Use trigonometric ratios and the Pythagorean Theorem to solve for sides and angles of right triangles in applied problems.

Prove the first five propositions in Book I of Euclid's Elements.

Investigate the relationships among the sides and angles of a spherical triangle.

Prove that the summit angles of an isosceles birectangle are congruent, but that it is impossible to prove they are right without referring to the parallel postulate or one of its consequences.

Compare and contrast the hypotheses of the acute angle (Hyperbolic), the right angle

(Euclidean), and the obtuse angle (Spherical).

Prove that under the hypothesis of the acute angle, similarity implies congruence.

Describe the societal factors that inhibited the development of non-Euclidean geometry.

Define the six trigonometric ratios in terms of x , y , and r using the unit circle centered at the origin of the coordinate plane. Interpret radian measures of angles as a rotation both counterclockwise and clockwise around the unit circle.

Determine the value(s) of trigonometric functions for a set of given conditions.

Restrict the domain of a trigonometric function to create an invertible function and graph the inverse function. Evaluate inverse trigonometric expressions.

Unit Test

Cumulative Exam

Lesson

Standards

Unit 6: Building and Interpreting Functions in Authentic Situations: Part One

Lesson

Standards

Relations and Functions

- A.FGR.2.4.
- A.FGR.9.1.
- A.PAR.6.1.
- A.PAR.6.2.
- AA.FGR.3.4.
- AA.FGR.5.7.

Use function notation to build and evaluate linear functions for inputs in their domains and interpret statements that use function notation in terms of a mathematical framework.

Use function notation to build and evaluate exponential functions for inputs in their domains and interpret statements that

- AFA.DSR.7.8.
- AFA.FGR.3.3.
- AFA.FGR.3.4.
- AFA.FGR.3.5.
- AFA.FGR.3.7.
- AFM.AQR.5.3.
- AFM.LR.2.5.
- CRM.FGR.4.1.
- CRM.FGR.4.6.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.GSR.3.1.

use function notation in terms of a context.

Interpret quadratic expressions and parts of a quadratic expression that represent a quantity in terms of its context.

Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.

Create exponential equations and use logarithms to solve mathematical, applicable problems for which only one variable is unknown.

Create and analyze quadratic equations to represent relationships between quantities as a model for contextual situations.

Apply the Arithmetic Average Formula to calculate and interpret a d -day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Describe the meaning of functions and how to determine if a relation is a function or not.

Utilize function notation to represent a functional relation and to evaluate functions.

Create, apply, and interpret linear functions to model real-world financial problems.

Create, apply, and interpret quadratic functions to model real-world financial applications.

Given a relation on two sets, determine whether the relation is a function and find its inverse relation, if it exists.

Use the method of mathematical induction to prove statements involving the positive integers.

Define a function through maps, sets, equations and graphs using function notation.

Construct linear and exponential functions, given a graph, a description of a relationship, or two input-output pairs.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Use coordinates to represent points in n dimensions and define and use arithmetic operations on n -dimensional points.

Domain and Range

- A.FGR.2.2.
- A.FGR.2.3.
- A.FGR.9.2.
- A.PAR.8.1.
- AA.FGR.3.5.
- AFA.FGR.3.5.
- AFA.FGR.3.6.
- AFA.FGR.3.7.
- AFA.FGR.3.8.
- AFA.FGR.3.9.
- CRM.FGR.4.1.

Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation.

Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the domain and range of linear functions.

Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

- CRM.FGR.4.2.
- CRM.FGR.4.3.
- CRM.FGR.4.8.
- PC.FGR.2.6.

Interpret exponential expressions and parts of an exponential expression that represent a quantity in terms of its framework.

Create and interpret logarithmic equations in one variable and use them to solve problems.

Create, apply, and interpret linear functions to model real-world financial problems.

Create, apply, and interpret exponential functions of the form $y = ab^x$ and classify them as exponential decay (when $0 < b < 1$) or as exponential growth (when $b > 1$).

Create, apply, and interpret quadratic functions to model real-world financial applications.

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Define a function through maps, sets, equations and graphs using function notation.

Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, 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.

Represent the behavior of a rational function using limit notation for vertical and horizontal asymptotes and end behavior.

Rate of Change

- A.FGR.2.2.
- A.FGR.2.3.
- A.FGR.7.7.
- A.FGR.9.2.
- A.GSR.3.1.
- A.GSR.3.2.
- A.PAR.8.1.
- AFA.DSR.7.8.
- AFA.FGR.3.6.
- AFA.FGR.3.7.
- AFA.FGR.3.8.
- AFA.FGR.3.9.
- AFA.NR.2.4.
- AFA.PAR.4.2.
- AFM.LR.2.5.
- C.FGR.4.3.
- CRM.FGR.4.3.
- CRM.FGR.4.4.
- CRM.GSR.5.1.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- MVC.PAR.2.4.

Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation.

Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the domain and range of linear functions.

Estimate, calculate, and interpret the average rate of change of a quadratic function and make comparisons to the average rate of change of linear functions.

Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

Interpret exponential expressions and parts of an exponential expression that represent a quantity in terms of its framework.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Create, apply, and interpret exponential functions of the form

$y = ab^x$ and classify them as exponential decay (when $0 < b < 1$) or as exponential growth (when $b > 1$).

Create, apply, and interpret quadratic functions to model real-world financial applications.

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Construct, solve, and interpret algebraic ratios and proportions.

Investigate the impact of changing the value of the different variables in financial formulas to compare the resulting financial outcomes.

Use the method of mathematical induction to prove statements involving the positive integers.

Identify intervals where functions are increasing, decreasing, and constant by using the relationship between the function and the sign of its first derivative.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Calculate and interpret the average rate of change of a function over a specified interval. Estimate the rate of change from a graph.

Use the distance formula, midpoint formula or slope to verify simple geometric properties.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Evaluate functions of two independent variables at a point in the plane.

Linear Functions

- A.FGR.2.2.
- A.FGR.2.3.
- A.FGR.7.7.
- A.GSR.3.1.
- A.GSR.3.2.
- AFA.DSR.7.8.
- AFA.DSR.8.1.
- AFA.FGR.3.5.
- AFA.FGR.3.8.
- AFA.FGR.3.9.
- AFM.LR.2.5.
- AMDM.FGR.9.2.
- CRM.FGR.4.1.
- CRM.FGR.4.2.
- CRM.FGR.4.3.
- CRM.FGR.4.6.
- CRM.FGR.4.8.
- CRM.GSR.5.1.
- EC.AR.2.3.

Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation.

Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the domain and range of linear functions.

Estimate, calculate, and interpret the average rate of change of a quadratic function and make comparisons to the average rate of change of linear functions.

Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n

- EC.AR.2.4. data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.
 - EC.AR.2.6. Identify a contextual, real-life problem that can be answered using investigative research.
 - EC.AR.2.8. Create, apply, and interpret linear functions to model real-world financial problems.
 - HM.LMIR.3.1. Create, apply, and interpret the greatest integer function in real-world financial applications.
- Create, apply, and interpret piecewise functions in real-world financial applications.
- Use the method of mathematical induction to prove statements involving the positive integers.
- Use linear, exponential, logistic, and piecewise functions to construct a model.
- Define a function through maps, sets, equations and graphs using function notation.
- Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.
- Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.
- Construct linear and exponential functions, given a graph, a description of a relationship, or two input-output pairs.
- Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, 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.

Use the distance formula, midpoint formula or slope to verify simple geometric properties.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Absolute Value Functions

- A.FGR.9.2.
- AA.FGR.3.5.
- AFA.FGR.3.8.
- AFA.FGR.3.9.
- AFA.GSR.6.2.
- AMDM.PAR.11.2.
- CRM.FGR.4.2.
- CRM.FGR.4.3.
- CRM.FGR.4.8.
- G.GSR.3.1.
- G.GSR.3.3.
- G.GSR.5.1.
- G.GSR.5.2.
- G.GSR.5.3.
- LACS.GSR.5.4.
- PC.FGR.2.1.

Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

Create and interpret logarithmic equations in one variable and use them to solve problems.

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Use factors of dilations to draw to scale in contextual situations.

Represent geometric transformations and solve problems using matrices.

Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, 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.

Use geometric reasoning and symmetries of regular polygons to develop definitions of rotations, reflections, and translations.

Use geometric descriptions of rigid motions to draw the transformed figures and to predict the effect on a given figure. Describe a sequence of transformations from one figure to another and use transformation properties to determine congruence.

Verify experimentally the properties of dilations.

Given two figures, use and apply the definition of similarity in terms of similarity transformations.

Use the properties of similarity transformations to establish criterion for two triangles to be similar. Use similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Find the image of a point under a transformation.

Graph piecewise-defined functions, including step functions and absolute value functions.

Quadratic Functions

- A.FGR.2.2.
- A.FGR.7.1.
- A.FGR.7.2.

Construct and interpret the graph of a linear function that models real-life phenomena and represent key charac-

- A.FGR.7.3.
- A.FGR.7.4.
- A.FGR.7.6.
- A.PAR.6.1.
- A.PAR.6.2.
- A.PAR.8.1.
- AA.FGR.5.1.
- AA.FGR.5.11.
- AA.FGR.5.7.
- AA.FGR.5.8.
- AA.FGR.5.9.
- AFA.DSR.7.8.
- AFA.FGR.3.6.
- AFA.FGR.3.7.
- AFA.FGR.3.8.
- AFA.FGR.3.9.
- AFM.LR.2.5.
- C.FGR.4.3.
- CRM.FGR.4.1.
- CRM.FGR.4.2.
- CRM.FGR.4.3.
- CRM.FGR.4.8.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.GSR.3.1.
- PC.FGR.3.7.

teristics of the graph using formal notation.

Relate the domain and range of a quadratic function to its graph and, where applicable, to the quantitative relationship it describes.

Identify the effect on the graph generated by a quadratic function when replacing $f(x)$ with $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.

Graph and analyze the key characteristics of quadratic functions.

Relate the domain and range of a quadratic function to its graph and, where applicable, to the quantitative relationship it describes.

Create quadratic functions in two variables to represent relationships between quantities; graph quadratic functions on the coordinate axes with labels and scales.

Interpret quadratic expressions and parts of a quadratic expression that represent a quantity in terms of its context.

Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.

Interpret exponential expressions and parts of an exponential expression that represent a quantity in terms of its framework.

Graph and analyze quadratic functions in contextual situations and include analysis of data sets with regressions.

Using all the zeros of a polynomial function, list all the factors and multiply to write a multiple of the polynomial function in standard form.

Create and analyze quadratic equations to represent relationships between quantities as a model for contextual situations.

Identify the number of zeros that exist for any polynomial based upon the greatest degree of the polynomial and the end behavior of the polynomial by observing the sign of the leading coefficient.

Identify zeros of polynomial functions using technology or pre-factored polynomials and use the zeros to construct a graph of the function defined by the polynomial function. Analyze identify key features of these polynomial functions.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Create, apply, and interpret exponential functions of the form $y = ab^x$ and classify them as exponential decay (when $0 < b < 1$) or as exponential growth (when $b > 1$).

Create, apply, and interpret quadratic functions to model real-world financial applications.

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Use the method of mathematical induction to prove statements involving the positive integers.

Identify intervals where functions are increasing, decreasing, and constant by using the relationship between the function and the sign of its first derivative.

Define a function through maps, sets, equations and graphs using function notation.

Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, 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.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Use coordinates to represent points in n dimensions and define and use arithmetic operations on n -dimensional points.

Classify the six trigonometric functions as even or odd and describe the symmetry.

Square Root Functions

- A.FGR.9.2.
- A.PAR.6.1.
- A.PAR.6.2.
- AA.FGR.3.5.
- AA.FGR.4.3.
- AA.FGR.5.10.
- AA.FGR.5.4.
- AA.FGR.5.7.
- AFA.DSR.7.8.
- AFA.FGR.3.10.
- AFA.FGR.3.7.
- AFM.AQR.5.3.
- AFM.LR.2.5.
- CRM.FGR.4.2.
- CRM.FGR.4.3.
- CRM.FGR.4.8.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.

Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

Interpret quadratic expressions and parts of a quadratic expression that represent a quantity in terms of its context.

Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.

Create and interpret logarithmic equations in one variable and use them to solve problems.

Analyze and graph radical functions.

Use the structure of an expression to factor polynomials, including the sum of cubes, the difference of cubes, and higher-order polynomials that may be expressed as a quadratic within a quadratic.

Use the structure of an expression to factor quadratics.

Create and analyze quadratic equations to represent relationships between quantities as a model for contextual situations.

Apply the Arithmetic Average Formula to calculate and interpret a d -day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Recognize real-world situations where square root, cubic, or rational functions apply.

Create, apply, and interpret quadratic functions to model real-world financial applications.

Given a relation on two sets, determine whether the relation is a function and find its inverse relation, if it exists.

Use the method of mathematical induction to prove statements involving the positive integers.

Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, 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.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Graphing Radical Functions

- A.FGR.9.2.
- AA.FGR.4.3.
- AFA.GSR.6.2.
- AMDM.PAR.11.2.
- CRM.FGR.4.2.
- CRM.FGR.4.3.
- CRM.FGR.4.8.
- G.GSR.3.1.
- G.GSR.3.3.
- G.GSR.5.1.
- G.GSR.5.2.
- G.GSR.5.3.
- LACS.GSR.5.4.

Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

Analyze and graph radical functions.

Use factors of dilations to draw to scale in contextual situations.

Represent geometric transformations and solve problems using matrices.

Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, 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.

Use geometric reasoning and symmetries of regular polygons to develop definitions of rotations, reflections, and translations.

Use geometric descriptions of rigid motions to draw the transformed figures and to predict the effect on a given figure. Describe a sequence of transformations from one figure to another and use transformation properties to determine congruence.

Verify experimentally the properties of dilations.

Given two figures, use and apply the definition of similarity in terms of similarity transformations.

Use the properties of similarity transformations to establish criterion for two triangles to be similar. Use similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Find the image of a point under a transformation.

Application of Rational Functions

Unit Test

Unit 7: Building and Interpreting Functions in Authentic Situations: Part Two

Lesson	Standards	
Rewriting Exponential Functions		
Graphing Exponential Functions	<ul style="list-style-type: none">• A.FGR.9.1.• A.FGR.9.2.• A.FGR.9.3.• A.PAR.8.1.• A.PAR.8.4.• AA.FGR.3.2.• AA.FGR.3.6.• AFA.FGR.3.6.• AFA.FGR.3.7.• AFA.FGR.3.8.• AFA.FGR.3.9.• AFA.GSR.6.2.• AFA.NR.2.1.	<p>Use function notation to build and evaluate exponential functions for inputs in their domains and interpret statements that use function notation in terms of a context.</p> <p>Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.</p> <p>Identify the effect on the graph generated by an exponential function when replacing $f(x)$ with $f(x) + k$, and $k f(x)$, for specific values of k (both positive and negative); find the value of k given the graphs.</p>

- AFA.PAR.4.2.
- AMDM.FGR.9.2.
- AMDM.PAR.11.2.
- AMDM.PAR.8.1.
- CRM.FGR.4.2.
- CRM.FGR.4.3.
- CRM.FGR.4.8.
- G.GSR.3.1.
- G.GSR.3.3.
- G.GSR.5.1.
- G.GSR.5.2.
- G.GSR.5.3.
- LACS.GSR.5.4.

Interpret exponential expressions and parts of an exponential expression that represent a quantity in terms of its framework.

Represent constraints by exponential equations and interpret data points as possible or not possible in a modeling environment.

Analyze, graph, and compare exponential and logarithmic functions.

Create, interpret, and solve exponential equations to represent relationships between quantities and analyze the relationships numerically with tables, algebraically, and graphically.

Create, apply, and interpret exponential functions of the form $y = ab^x$ and classify them as exponential decay (when $0 < b < 1$) or as exponential growth (when $b > 1$).

Create, apply, and interpret quadratic functions to model real-world financial applications.

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Use factors of dilations to draw to scale in contextual situations.

Use fractions, decimals, percents, and ratios to solve problems related to budgets, income tax rates, payroll deductions, pie charts, percent yield, sales tax, percent populations, rent increase, cost savings, debt-to-income ratios, stock splits, floor plans and scale models, trigonometric calculations, banking services, and

other business and financial applications.

Investigate the impact of changing the value of the different variables in financial formulas to compare the resulting financial outcomes.

Use linear, exponential, logistic, and piecewise functions to construct a model.

Represent geometric transformations and solve problems using matrices.

Use exponential functions to model change in a variety of financial situations.

Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, 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.

Use geometric reasoning and symmetries of regular polygons to develop definitions of rotations, reflections, and translations.

Use geometric descriptions of rigid motions to draw the transformed figures and to predict the effect on a given figure. Describe a sequence of transformations from one figure to another and use transformation properties to determine congruence.

Verify experimentally the properties of dilations.

Given two figures, use and apply the definition of similarity in terms of similarity transformations.

Use the properties of similarity transformations to establish criterion for two triangles to be similar. Use similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Find the image of a point under a transformation.

Graphing Logarithmic Functions

- A.FGR.9.2.
- A.PAR.8.1.
- AA.FGR.3.1.
- AA.FGR.3.2.
- AA.FGR.3.3.
- AA.FGR.3.7.
- AFA.FGR.3.6.
- AFA.FGR.3.7.
- AFA.FGR.3.8.
- AFA.FGR.3.9.
- AFA.GSR.6.2.
- AFM.AQR.5.3.
- AMDM.PAR.11.2.
- CRM.FGR.4.2.
- CRM.FGR.4.3.
- CRM.FGR.4.8.
- G.GSR.3.1.
- G.GSR.3.3.
- G.GSR.5.1.
- G.GSR.5.2.
- G.GSR.5.3.
- LACS.GSR.5.4.

Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

Interpret exponential expressions and parts of an exponential expression that represent a quantity in terms of its framework.

Find the inverse of exponential and logarithmic functions using equations, tables, and graphs, limiting the domain of inverses where necessary to maintain functionality, and prove by composition or verify by inspection that one function is the inverse of another.

Analyze, graph, and compare exponential and logarithmic functions.

Use the definition of a logarithm, logarithmic properties, and the inverse relationship between exponential and logarithmic functions to solve problems in context.

Create, interpret, and solve logarithmic equations in two or more variables to represent relationships between quantities.

Create, apply, and interpret exponential functions of the form $y = ab^x$ and classify them as exponential decay (when $0 < b$

< 1) or as exponential growth (when $b > 1$).

Create, apply, and interpret quadratic functions to model real-world financial applications.

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Use factors of dilations to draw to scale in contextual situations.

Given a relation on two sets, determine whether the relation is a function and find its inverse relation, if it exists.

Represent geometric transformations and solve problems using matrices.

Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, 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.

Use geometric reasoning and symmetries of regular polygons to develop definitions of rotations, reflections, and translations.

Use geometric descriptions of rigid motions to draw the transformed figures and to predict the effect on a given figure. De-

scribe a sequence of transformations from one figure to another and use transformation properties to determine congruence.

Verify experimentally the properties of dilations.

Given two figures, use and apply the definition of similarity in terms of similarity transformations.

Use the properties of similarity transformations to establish criterion for two triangles to be similar. Use similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Find the image of a point under a transformation.

Arithmetic Sequences

Geometric Sequences

Comparing Characteristics of Functions

Functions and Transformations

- A.FGR.7.2.
- A.FGR.7.3.
- A.FGR.7.6.
- A.FGR.9.2.
- A.FGR.9.3.
- AA.FGR.3.2.
- AA.FGR.3.6.
- AA.FGR.5.1.
- AA.FGR.8.3.
- AFA.FGR.3.8.
- AFA.FGR.3.9.
- CRM.FGR.4.2.
- CRM.FGR.4.8.

Identify the effect on the graph generated by a quadratic function when replacing $f(x)$ with $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.

Graph and analyze the key characteristics of quadratic functions.

Create quadratic functions in two variables to represent relationships between quantities; graph quadratic functions on the coordinate axes with labels and scales.

Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

- EC.AR.2.5.
- EC.AR.2.6.
- EC.AR.2.8.
- PC.FGR.2.1.
- PC.FGR.2.5.
- PC.FGR.2.6.
- PC.FGR.2.7.
- PC.FGR.3.7.

Identify the effect on the graph generated by an exponential function when replacing $f(x)$ with $f(x) + k$, and $k f(x)$, for specific values of k (both positive and negative); find the value of k given the graphs.

Analyze, graph, and compare exponential and logarithmic functions.

Create, interpret, and solve exponential equations to represent relationships between quantities and analyze the relationships numerically with tables, algebraically, and graphically.

Graph and analyze quadratic functions in contextual situations and include analysis of data sets with regressions.

Graph rational functions, identifying key characteristics.

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Identify and sketch by hand the parent graph of functions expressed algebraically and show key characteristics of the graph using technology.

Identify the effect on the parent graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, 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.

Monitor and reflect on the process of mathematical problem solving and interpret solutions that arise in engineering contexts.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Graph piecewise-defined functions, including step functions and absolute value functions.

Graph rational functions and identify key characteristics.

Represent the behavior of a rational function using limit notation for vertical and horizontal asymptotes and end behavior.

Represent the limit of a function using both the informal definition and the graphical interpretation in the context of rational functions; interpret limits expressed in analytic notation.

Classify the six trigonometric functions as even or odd and describe the symmetry.

Modeling with Functions in Financial Contexts

Unit Test

Unit 8: Analyzing Financial Investments: Part One

Lesson	Standards	
Literal Equations	<ul style="list-style-type: none">• AFA.DSR.7.8.• AFA.PAR.4.1.• AFA.PAR.4.2.• AFM.LR.2.5.• CRM.PAR.3.5.• EC.AR.2.3.• EC.AR.2.4.	<p>Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.</p> <p>Use and rearrange formulas applicable to real-world contexts.</p> <p>Investigate the impact of changing the value of the different variables in financial for-</p>

- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- MVC.PAR.2.4.

mulas to compare the resulting financial outcomes.

Use the method of mathematical induction to prove statements involving the positive integers.

Rearrange literal equations to highlight a specified variable using the same reasoning as in solving equations.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Evaluate functions of two independent variables at a point in the plane.

Absolute Value and Linear Equations in Financial Contexts

Absolute Value and Linear Inequalities in Financial Context

Solving Linear Systems Graphically

- A.PAR.4.3.
- AFA.DSR.7.8.
- AFA.PAR.5.1.
- AFA.PAR.5.5.
- AFM.LR.2.5.
- CRM.PAR.3.7.

Solve systems of linear inequalities by graphing, including systems representing a mathematically applicable situation.

- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.PAR.8.6.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Write, graph, solve, and interpret systems of linear equations given an applicable financial situation.

Solve linear systems of equations and inequalities to identify points of intersection and define domains in the context of the problem situation.

Use the method of mathematical induction to prove statements involving the positive integers.

Using multiple methods, create and solve systems of linear equations and inequalities.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Use Cramer's Rule to solve a system of linear equations.

Solving Linear Systems by Elimination

- AFA.DSR.7.8.
- AFA.PAR.5.1.
- AFA.PAR.5.5.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

- AFM.LR.2.5.
- CRM.PAR.3.7.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.PAR.8.6.

Write, graph, solve, and interpret systems of linear equations given an applicable financial situation.

Solve linear systems of equations and inequalities to identify points of intersection and define domains in the context of the problem situation.

Use the method of mathematical induction to prove statements involving the positive integers.

Using multiple methods, create and solve systems of linear equations and inequalities.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Use Cramer's Rule to solve a system of linear equations.

Solving Linear Systems by Substitution

- AFA.DSR.7.8.
- AFA.PAR.5.1.
- AFA.PAR.5.5.
- AFM.LR.2.5.
- CRM.PAR.3.7.
- EC.AR.2.3.
- EC.AR.2.4.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Write, graph, solve, and interpret systems of linear equations given an applicable financial situation.

Solve linear systems of equations and inequalities to identify

- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.PAR.8.6.

points of intersection and define domains in the context of the problem situation.

Use the method of mathematical induction to prove statements involving the positive integers.

Using multiple methods, create and solve systems of linear equations and inequalities.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Use Cramer's Rule to solve a system of linear equations.

Modeling with Linear Systems

- A.PAR.4.3.
- AFA.DSR.7.8.
- AFA.FGR.3.11.
- AFA.FGR.3.5.
- AFA.PAR.5.1.
- AFA.PAR.5.5.
- AFM.LR.2.5.
- CRM.FGR.4.6.
- CRM.PAR.3.2.
- CRM.PAR.3.7.

Solve systems of linear inequalities by graphing, including systems representing a mathematically applicable situation.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Create and use inequalities to define domains when creating algebraic expressions and functions.

- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.PAR.8.6.

Create, apply, and interpret linear functions to model real-world financial problems.

Write, graph, solve, and interpret systems of linear equations given an applicable financial situation.

Solve linear systems of equations and inequalities to identify points of intersection and define domains in the context of the problem situation.

Use the method of mathematical induction to prove statements involving the positive integers.

Construct linear and exponential functions, given a graph, a description of a relationship, or two input-output pairs.

Create inequalities in one variable and use them to solve problems.

Using multiple methods, create and solve systems of linear equations and inequalities.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Use Cramer's Rule to solve a system of linear equations.

Quadratic Functions and Equations in Financial Context

Mixed Degree Systems

- AA.FGR.5.6.
- AFA.DSR.7.8.
- AFA.PAR.5.2.
- AFM.LR.2.5.
- CRM.PAR.3.8.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.

Solve systems of quadratic and linear functions to determine points of intersection.

Apply the Arithmetic Average Formula to calculate and interpret a d-day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Write, graph, solve, and interpret systems of equations containing one linear and one quadratic equation, given an applicable financial situation.

Use the method of mathematical induction to prove statements involving the positive integers.

Solve a simple system of equations consisting of a linear and a quadratic equation in two variables. algebraically and graphically.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Solving One-Variable Equations with Systems

- A.PAR.6.1.
- A.PAR.6.2.

Interpret quadratic expressions and parts of a quadratic expression that represent a quantity in terms of its context.

- A.PAR.6.3.
- A.PAR.6.4.
- AA.FGR.5.5.
- AA.FGR.5.6.
- AA.FGR.5.7.
- AFA.DSR.7.8.
- AFA.FGR.3.7.
- AFA.PAR.5.1.
- AFA.PAR.5.2.
- AFA.PAR.5.5.
- AFM.LR.2.5.
- CRM.PAR.3.1.
- CRM.PAR.3.4.
- CRM.PAR.3.7.
- CRM.PAR.3.8.
- EC.AR.2.3.
- EC.AR.2.4.
- EC.AR.2.6.
- EC.AR.2.8.
- HM.LMIR.3.1.
- LACS.PAR.8.6.

Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.

Create and solve quadratic equations in one variable and explain the solution in the framework of applicable phenomena.

Represent constraints by quadratic equations and interpret data points as possible or not possible in a modeling framework.

Write and solve quadratic equations and inequalities with real coefficients and use the solution to explain a mathematical, applicable situation.

Solve systems of quadratic and linear functions to determine points of intersection.

Create and analyze quadratic equations to represent relationships between quantities as a model for contextual situations.

Apply the Arithmetic Average Formula to calculate and interpret a d -day simple moving average given a set of n data points, $p(1)$, $p(2)$, $p(3)$, ..., $p(n-1)$, $p(n)$.

Create, apply, and interpret quadratic functions to model real-world financial applications.

Write, graph, solve, and interpret systems of linear equations given an applicable financial situation.

Write, graph, solve, and interpret systems of equations containing one linear and one quadratic equation, given an applicable financial situation.

Solve linear systems of equations and inequalities to identify points of intersection and define domains in the context of the problem situation.

Use the method of mathematical induction to prove statements involving the positive integers.

Create equations in one variable and use them to solve problems.

Solve quadratic equations using a variety of methods.

Using multiple methods, create and solve systems of linear equations and inequalities.

Solve a simple system of equations consisting of a linear and a quadratic equation in two variables. algebraically and graphically.

Apply and adapt a variety of appropriate strategies to solve problems.

Use visual and written communication to organize, record, and articulate coherent, mathematical thinking and to express basic design elements.

Produce multiple representations for mathematics presented in engineering contexts.

Use mathematical representations to model and interpret physical and engineering phenomena.

Prove statements in a deductive system by using its definitions, postulates, and axioms

Use Cramer's Rule to solve a system of linear equations.

Unit Test

Lesson

Standards

Rational Equations in Financial Contexts

Radical Equations and Extraneous Roots

- AA.FGR.3.5.
- AA.FGR.4.2.
- AA.FGR.4.4.
- AA.FGR.4.5.
- AFA.DSR.8.1.
- AFA.FGR.3.10.
- AFA.FGR.3.6.
- AFA.FGR.3.8.
- AFA.FGR.3.9.

Create and interpret logarithmic equations in one variable and use them to solve problems.

Solve radical equations in one variable, and give examples showing how extraneous solutions may arise.

Create, interpret and solve radical equations with one unknown value and use them to solve problems that model real-world situations.

Create, interpret, and solve radical equations in two or more variables to represent relationships between quantities.

Identify a contextual, real-life problem that can be answered using investigative research.

Recognize real-world situations where square root, cubic, or rational functions apply.

Create, apply, and interpret exponential functions of the form $y = ab^x$ and classify them as exponential decay (when $0 < b < 1$) or as exponential growth (when $b > 1$).

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Exponential Equations in Financial Contexts

Solving Exponential and Logarithmic Equations

- A.PAR.8.1.
- AA.FGR.3.1.

Interpret exponential expressions and parts of an exponential expression that represent a

- AA.FGR.3.2.
- AA.FGR.3.3.
- AA.FGR.3.5.
- AA.FGR.3.6.
- AA.FGR.3.7.
- AFA.FGR.3.6.
- AFA.PAR.4.2.
- AFM.AQR.5.3.
- AMDM.FGR.9.2.
- AMDM.PAR.8.1.

quantity in terms of its framework.

Find the inverse of exponential and logarithmic functions using equations, tables, and graphs, limiting the domain of inverses where necessary to maintain functionality, and prove by composition or verify by inspection that one function is the inverse of another.

Analyze, graph, and compare exponential and logarithmic functions.

Use the definition of a logarithm, logarithmic properties, and the inverse relationship between exponential and logarithmic functions to solve problems in context.

Create and interpret logarithmic equations in one variable and use them to solve problems.

Create, interpret, and solve exponential equations to represent relationships between quantities and analyze the relationships numerically with tables, algebraically, and graphically.

Create, interpret, and solve logarithmic equations in two or more variables to represent relationships between quantities.

Create, apply, and interpret exponential functions of the form $y = ab^x$ and classify them as exponential decay (when $0 < b < 1$) or as exponential growth (when $b > 1$).

Investigate the impact of changing the value of the different variables in financial formulas to compare the resulting financial outcomes.

Given a relation on two sets, determine whether the relation is a function and find its inverse relation, if it exists.

Use linear, exponential, logistic, and piecewise functions to construct a model.

Use exponential functions to model change in a variety of financial situations.

Modeling with Exponential and Logarithmic Equations

- A.FGR.9.2.
- A.PAR.8.1.
- AA.FGR.3.1.
- AA.FGR.3.2.
- AA.FGR.3.3.
- AA.FGR.3.5.
- AA.FGR.3.6.
- AA.FGR.3.7.
- AFA.DSR.8.1.
- AFA.FGR.3.10.
- AFA.FGR.3.6.
- AFA.FGR.3.8.
- AFA.FGR.3.9.
- AFA.PAR.4.2.
- AMDM.FGR.9.2.
- AMDM.PAR.8.1.
- CRM.FGR.4.3.

Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.

Interpret exponential expressions and parts of an exponential expression that represent a quantity in terms of its framework.

Find the inverse of exponential and logarithmic functions using equations, tables, and graphs, limiting the domain of inverses where necessary to maintain functionality, and prove by composition or verify by inspection that one function is the inverse of another.

Analyze, graph, and compare exponential and logarithmic functions.

Use the definition of a logarithm, logarithmic properties, and the inverse relationship between exponential and logarithmic functions to solve problems in context.

Create and interpret logarithmic equations in one variable and use them to solve problems.

Create, interpret, and solve exponential equations to represent relationships between quantities and analyze the relationships numerically with tables, algebraically, and graphically.

Create, interpret, and solve logarithmic equations in two or more variables to represent relationships between quantities.

Identify a contextual, real-life problem that can be answered using investigative research.

Recognize real-world situations where square root, cubic, or rational functions apply.

Create, apply, and interpret exponential functions of the form $y = ab^x$ and classify them as exponential decay (when $0 < b < 1$) or as exponential growth (when $b > 1$).

Create, apply, and interpret the greatest integer function in real-world financial applications.

Create, apply, and interpret piecewise functions in real-world financial applications.

Investigate the impact of changing the value of the different variables in financial formulas to compare the resulting financial outcomes.

Use linear, exponential, logistic, and piecewise functions to construct a model.

Use exponential functions to model change in a variety of financial situations.

Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function.

Unit Test

Unit 10: Capstone Project

Lesson	Standards
Completing a Capstone Project	

Cumulative Exam

Lesson

Standards