



VASHON ISLAND SCHOOL DISTRICT

MATHEMATICS GUIDE

GRADES 9 THROUGH 12

Revised June 2006

Ninth Grade ALGEBRA

Ninth Grade	Introduced/Practiced During Year	Delivery Methods	Year-end Proficiencies	State GLEs
Number Sense	<p>Evaluate expressions containing grouping symbols Classify numbers Compare numbers Add real numbers using models and rules Apply addition Subtract real numbers Apply subtraction Multiply real numbers Divide real numbers Use the Distributive Property Identify properties Find ratios and rates Solve proportions Explain a method for determining whether a real-world problem involves direct proportion or inverse proportion. [SP, CU, MC] Explain a method for solving a real-world problem involving direct proportion. [CU, MC] Explain a method for solving a real-world problem involving inverse proportion. [CU, MC] Solve problems using direct or inverse models (e.g., similarity, age of car vs. worth). [SP, MC] Explain, illustrate, or describe examples of direct proportion. [CU] Explain, illustrate, or describe examples of inverse proportion. [CU] Find missing measures of similar figures Use similar figures when measuring indirectly Use proportions when solving percent problems Write and solve percent equations Find percent of change Write the equation for direct variation Use ratios and proportions with direct variation Read and use scientific and exponential notation. [MC, RL] Identify a real-life situation to match a particular number written in scientific or exponential notation and justify the answer. [MC, RL] Use scientific or exponential notation to simplify a problem. [RL, MC] Illustrate the meaning of scientific notation using pictures, diagrams, or numbers. [CU] Read and translate numbers represented in scientific notation from calculators and other technology, tables, and charts.</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Read and use scientific and exponential notation. [MC, RL] Identify a real-life situation to match a particular number written in scientific or exponential notation and justify the answer. [MC, RL] Use scientific or exponential notation to simplify a problem. [RL, MC] Illustrate the meaning of scientific notation using pictures, diagrams, or numbers. [CU] Read and translate numbers represented in scientific notation from calculators and other technology, tables, and charts. Explain a method for determining whether a real-world problem involves direct proportion or inverse proportion. [SP, CU, MC] Explain a method for solving a real-world problem involving direct proportion. [CU, MC] Explain a method for solving a real-world problem involving inverse proportion. [CU, MC] Solve problems using direct or inverse models (e.g., similarity, age of car vs. worth). [SP, MC] Explain, illustrate, or describe examples of direct proportion. [CU] Explain, illustrate, or describe examples of inverse proportion. [CU] Explain, illustrate, or describe examples of inverse proportion. [CU] Complete multi-step computations using order of operations in situations involving combinations of rational numbers including whole number exponents and square roots of square numbers. [MC] Calculate using order of operations on all forms of rational numbers (e.g., $(3 \cdot 2 + 5) \cdot 2 - 8$, $22 + 32$). Use properties to reorder and rearrange expressions to compute more efficiently. [RL] Identify when an approximation is appropriate. [MC] Explain situations involving real numbers where estimates are sufficient and others for which exact value is required. [CU] Justify why an estimate would be used rather than an exact answer in a given situation. [CU] Describe various strategies used during estimation involving integers, rational numbers. [CU] Use estimation to predict or to</p>	<p>1.1.1</p> <p>1.1.4</p> <p>1.1.6</p> <p>1.1.8</p>

	<p>Multiply powers Raise a power to a power Raise a product to a power Find square roots Estimate and use square roots Use the quadratic formula when solving quadratic equations Solve inverse variations Compare direct and indirect inverse variation Multiply rational expressions Divide rational expressions Complete multi-step computations using order of operations in situations involving combinations of rational numbers including whole number exponents and square roots of square numbers. [MC] Calculate using order of operations on all forms of rational numbers (e.g., $(3 \cdot 2 + 5)^2 - 8$, $22 + 32$). Use properties to reorder and rearrange expressions to compute more efficiently. [RL] Identify when an approximation is appropriate. [MC] Explain situations involving real numbers where estimates are sufficient and others for which exact value is required. [CU] Justify why an estimate would be used rather than an exact answer in a given situation. [CU] Describe various strategies used during estimation involving integers, rational numbers. [CU] Use estimation to predict or to verify the reasonableness of calculated results. [RL]</p>		<p>verify the reasonableness of calculated results. [RL]</p>	
Measurement	<p>Find percent error Find rates of change from tables and graphs Convert within a system to a unit size appropriate to a given situation. Identify situations in which approximate measurements are sufficient. Estimate a reasonable measurement at an appropriate level of precision. [MC] Estimate quantities using derived units of measure (e.g., distance or time using miles per hour, cost using unit cost). [MC] Estimate derived units of measure (e.g., miles per hour, people/year, grams/cubic centimeters). [MC]</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Convert within a system to a unit size appropriate to a given situation. Identify situations in which approximate measurements are sufficient. Estimate a reasonable measurement at an appropriate level of precision. [MC] Estimate quantities using derived units of measure (e.g., distance or time using miles per hour, cost using unit cost). [MC] Estimate derived units of measure (e.g., miles per hour, people/year, grams/cubic centimeters). [MC]</p>	<p>1.2.3 1.2.6</p>
Geometric Sense	<p>Graph points on the coordinate plane Find slope Determine whether lines are parallel Determine whether lines are perpendicular Solve problems using the</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and</p>	<p>Make and test conjectures about two-dimensional and three-dimensional shapes and their individual attributes and relationships using physical, symbolic, and technological models (e.g., diagonal of a</p>	<p>1.3.1</p>

	<p>Find combinations Find probability with counting techniques Generate the outcomes and probability of multiple independent and dependent events using a model or procedure (e.g., tree diagram, area model, counting procedures). Generate the outcomes and probability of events using a counting procedure (e.g., the number of license plates that can be made with three letters and three numbers; winning the lottery). [MC] Explain the relationship between theoretical probability and empirical frequency of dependent events using simulations with and without technology. [CU] Create a simple game based on independent probabilities wherein all players have an equal probability of winning. [MC, SP] Create a simple game based on compound probabilities. [MC, SP] Determine the sample space for independent or dependent events. Identify sources of bias in data collection questions, samples, and/or methods and describe how such bias can be controlled. [RL, CU] Evaluate methods and technology used to investigate a research question. [CU, MC] Collect data using appropriate methods. Use technology appropriately to collect data. [RL, MC] Identify appropriate data collection methods that might impact the accuracy of the results of a given situation. [RL, CU] Determine whether the sample for a given study was from a representative sample. Determine whether the methods of data collection used were appropriate for a given question or population. [RL] Determine whether a straight line is an appropriate way to describe a trend in a set of bivariate data. [MC, RL] Determine whether the underlying model for a set of data is linear. [RL, MC] Decide and explain whether it is appropriate to extend a given data set following a line of best fit. [RL, MC] Determine whether a linear prediction from a given set of data is appropriate for the data and support the decision with data.</p>		<p>lottery). [MC] Explain the relationship between theoretical probability and empirical frequency of dependent events using simulations with and without technology. [CU] Create a simple game based on independent probabilities wherein all players have an equal probability of winning. [MC, SP] Create a simple game based on compound probabilities. [MC, SP] Determine the sample space for independent or dependent events. Identify sources of bias in data collection questions, samples, and/or methods and describe how such bias can be controlled. [RL, CU] Evaluate methods and technology used to investigate a research question. [CU, MC] Collect data using appropriate methods. Use technology appropriately to collect data. [RL, MC] Identify appropriate data collection methods that might impact the accuracy of the results of a given situation. [RL, CU] Determine whether the sample for a given study was from a representative sample. Determine whether the methods of data collection used were appropriate for a given question or population. [RL] Determine whether a straight line is an appropriate way to describe a trend in a set of bivariate data. [MC, RL] Determine whether the underlying model for a set of data is linear. [RL, MC] Decide and explain whether it is appropriate to extend a given data set following a line of best fit. [RL, MC] Determine whether a linear prediction from a given set of data is appropriate for the data and support the decision with data. [MC]. Determine whether an equation for a line is appropriate for a given set of data and support the judgment with data. [RL, MC] Use technology to generate data to fit a linear model. [SP, MC] Identify trends in a set of data in order to make a prediction based on the information. [CU, MC] Justify a prediction or an inference based on a set of data. [CU, MC] State possible factors that may influence a trend but not be</p>	<p>1.4.3</p> <p>1.4.5</p> <p>1.4.6</p>
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	<p>[MC]. Determine whether an equation for a line is appropriate for a given set of data and support the judgment with data. [RL, MC] Use technology to generate data to fit a linear model. [SP, MC] Identify trends in a set of data in order to make a prediction based on the information. [CU, MC] Justify a prediction or an inference based on a set of data. [CU, MC] State possible factors that may influence a trend but not be reflected in the data (e.g., population growth of deer vs. availability of natural resources or hunting permits). [MC, CU, RL] Use statistics to support different points of view. [RL] Analyze a set of statistics to develop a logical point of view. [RL, CU, MC] Justify or refute claims and supporting arguments based on data. [CU, MC] Determine whether statistics have been used or misused to support a point of view or argument and support the evaluation with data. [RL]</p>		<p>reflected in the data (e.g., population growth of deer vs. availability of natural resources or hunting permits). [MC, CU, RL] Use statistics to support different points of view. [RL] Analyze a set of statistics to develop a logical point of view. [RL, CU, MC] Justify or refute claims and supporting arguments based on data. [CU, MC] Determine whether statistics have been used or misused to support a point of view or argument and support the evaluation with data. [RL]</p>	
Algebraic Sense	<p>Model relationships with variables Model relationships with equations and formulas Simplify and evaluate expressions and formulas Solve equations using addition and subtraction Solve equations using multiplication and division Solve multi-step equations. [SP, RL] Use the Distributive Property when combining like terms Use the Distributive Property when solving equations Solve equations with variables on both sides Identify equations that are identities or have no solutions Define a variable in terms of another variable Model distance-rate-time problems Transform literal equations Identify solutions of inequalities Graph and write inequalities Use addition to solve inequalities Use subtraction to solve inequalities Use multiplication to solve inequalities Use division to solve inequalities Solve and graph inequalities containing “and” Solve and graph inequalities containing “or”</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Recognize, extend, or create a pattern or sequence between sets of numbers and/or linear patterns. [RL, CU, MC] Identify, extend, or create a geometric or arithmetic sequence or pattern. [RL, CU] Translate among equivalent numerical, graphical, and algebraic forms of a linear function. RL, MC] Make predictions based on a pattern or sequence. Find the equation of a line in a variety of ways (e.g., from a table, graph, slope-intercept, point-slope, two points). [RL, MC] Generate and use rules for a pattern to make predictions about future events (e.g., population growth, future sales, growth of corn stalks, future value of savings account). [SP, RL, MC] Identify or write an equation or rule to describe a pattern, sequence, and/or a linear function. [RL, CU, MC] Write an equation for a line given a set of information (e.g., two points, point-slope, etc.). [CU, MC] Write a recursive definition of a geometric pattern (e.g., Start and New = Old * Number). [CU, MC] Represent systems of equations</p>	<p>1.5.1</p> <p>1.5.2</p>

	<p>form $y = ax^2 + bx + c$</p> <p>Solve quadratic equations by graphing</p> <p>Solve quadratic functions by using square roots</p> <p>Solve quadratic equations by factoring</p> <p>Solve quadratic equations by completing the square</p> <p>Use the quadratic formula when solving quadratic equations</p> <p>Choose an appropriate method for solving a quadratic equation</p> <p>Find the number of solutions of a quadratic equation</p> <p>Choose a linear, quadratic, or exponential model for data</p> <p>Simplify radicals involving products</p> <p>Simplify radicals involving quotients</p> <p>Solve problems using the Pythagorean Theorem</p> <p>Simplify sums and differences</p> <p>Simplify products and quotients</p> <p>Solve equations containing radicals</p> <p>Identify extraneous solutions</p> <p>Graph square root functions</p> <p>Translate graphs of square root functions</p> <p>Solve problems using trigonometric ratios</p> <p>Graph rational functions</p> <p>Identify types of functions</p> <p>Simplify rational expressions</p> <p>Divide polynomials</p> <p>Add and subtract rational expressions with like denominators</p> <p>Add and subtract rational expressions with unlike denominators</p> <p>Solve rational equations</p> <p>Solve rational proportions</p> <p>Recognize, extend, or create a pattern or sequence between sets of numbers and/or linear patterns. [RL, CU, MC]</p> <p>Identify, extend, or create a geometric or arithmetic sequence or pattern. [RL, CU]</p> <p>Translate among equivalent numerical, graphical, and algebraic forms of a linear function. RL, MC]</p> <p>Make predictions based on a pattern or sequence.</p> <p>Find the equation of a line in a variety of ways (e.g., from a table, graph, slope-intercept, point-slope, two points). [RL, MC]</p> <p>Generate and use rules for a pattern to make predictions about future events (e.g., population growth, future sales, growth of corn stalks, future value of savings account). [SP, RL, MC]</p> <p>Identify or write an equation or rule to describe a pattern, sequence, and/or a linear</p>		<p>investment or profit options, determine when both options will yield the same result).</p> <p>Use systems of equations to determine the most advantageous outcome given a situation (e.g., given two investment options, determine under what conditions each will yield the best result.).</p> <p>[MC, SP]</p>	
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	<p>function. [RL, CU, MC] Write an equation for a line given a set of information (e.g., two points, point-slope, etc.). [CU, MC] Write a recursive definition of a geometric pattern (e.g., Start and New = Old * Number). [CU, MC] Represent systems of equations and inequalities graphically. [RL, MC] Write a story that represents a given linear equation or expression. [CU, MC] Write an expression, equation, or inequality with two variables representing a linear model of a real-world problem. [CU, MC] Represent variable quantities through expressions, equations, inequalities, graphs, and tables to represent linear situations involving whole number powers and square and cube roots. [CU, MC] Identify and use variable quantities to read and write expressions and equations to represent situations that can be described using repeated addition (e.g., models that are linear in nature). [CU, MC] Identify and use variable quantities to read and write expressions and equations to represent situations that can be described using repeated multiplication (e.g., models that are exponential such as savings accounts and early stages of population growth). [CU, MC] Recognize and write equations in recursive form for additive models (e.g., starting value, New=Old + some number). [CU, MC] Recognize and write equations in recursive form for multiplicative models (e.g., starting value, New=Old × some number). [CU, MC] Select an expression or equation to represent a given real world situation. [MC] Justify a simplification of an expression involving exponents. [RL, CU] Use multiple mathematical strategies and properties to simplify expressions. Solve real-world situations involving linear relationships and verify that the solution makes sense in relation to the problem. [SP, RL, CU, MC] Find the solution to a system of linear equations using tables, graphs, and symbols. [CU, MC] Interpret solutions of systems of equations. [CU, MC]</p>			
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	<p>Use systems of equations to analyze and solve real-life problems. [SP, CU, MC]</p> <p>Determine when two linear options yield the same outcome (e.g., given two different investment or profit options, determine when both options will yield the same result).</p> <p>Use systems of equations to determine the most advantageous outcome given a situation (e.g., given two investment options, determine under what conditions each will yield the best result.).</p> <p>[MC, SP]</p>			
Problem Solving	<p>Solve equations using addition and subtraction</p> <p>Solve equations using multiplication and division</p> <p>Solve equations with variables on both sides</p> <p>Identify equations that are identities or have no solution</p> <p>Define a variable in terms of another variable</p> <p>Model distance-rate-time problems</p> <p>Solve multi-step inequalities with variables on one side</p> <p>Solve multi-step inequalities with variables on both sides</p> <p>Solve and graph inequalities containing “and”</p> <p>Solve and graph inequalities containing “or”</p> <p>Solve equations that involve absolute value</p> <p>Solve inequalities that involve absolute value</p> <p>Find missing measures of similar figures</p> <p>Use similar figures when measuring indirectly</p> <p>Use proportions when solving percent problems</p> <p>Write and solve percent equations</p> <p>Find percent of change</p> <p>Find percent of error</p> <p>Find theoretical probability</p> <p>Find experimental probability</p> <p>Find the probability of independent events</p> <p>Find the probability of dependent events</p> <p>Interpret, sketch, and analyze graphs from situations</p> <p>Write a function rule given a table or a real-world situation</p> <p>Write the equation of a direct variation</p> <p>Use ratios and proportions with direct variations</p> <p>Use inductive reasoning in continuing number patterns</p> <p>Write rules for arithmetic sequences</p> <p>Graph equations using intercepts</p> <p>Write equations in standard form</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Use strategies to become informed about the situation (e.g., listing information; examine the table for patterns; create a scatter plot to look for patterns; asking questions).</p> <p>Summarize the problem (e.g., there are Olympic winning times over the past 50 years; both men’s and women’s times are decreasing; will there come a time when women run faster than men).</p> <p>Determine whether enough information is given to find a solution (e.g., list what is needed to be found; extend the pattern to see if women’s times will be less).</p> <p>Determine whether information is missing or extraneous (e.g., compare the list of known things to the list of needed things to see if there are things that are not needed).</p> <p>Define the problem (e.g., if the pattern continues in the same fashion, will women run faster than men and, if so, when will that occur).</p> <p>Organize relevant information from multiple sources (e.g., create a list of known and unknown information; create a scatter plot of men’s and women’s times vs. time on the same coordinate axis to analyze the patterns).</p> <p>Select and apply appropriate mathematical tools to devise a strategy in a situation (e.g., if the data, in either tabular or graphical form, suggest a linear relationship, plan to find a linear equation for each set of data; solve those equations simultaneously [or use technology to find the intersection of the two lines] to answer the question). If the data pattern suggests a non-linear model, plan to project what the pattern is and extend that pattern.</p>	<p>2.1.1</p> <p>2.2.1</p>

	<p>Graph and write linear equations using point-slope form Write a linear equation using data Determine whether lines are parallel Determine whether lines are perpendicular Write an equation for a trend line and use it to make predictions Write the equation for a line of best fit and use it to make predictions. Graph linear inequalities Use linear inequalities when modeling real-world situations Solve systems of linear inequalities by graphing Model real-world situations using systems of linear inequalities Raise a power to a power Raise a product to a power Divide powers with the same base Raise a quotient to a power Use geometric sequences Use formulas when describing geometric sequences Model exponential growth Model exponential decay Factor trinomials Factor trinomials of the type $ax^2 + bx + c$ Factor perfect-square trinomials Factor the difference of squares Factor polynomials with four terms Factor trinomials by grouping Solve inverse variations Compare direct and inverse variation Multiply rational expressions Divide rational expressions Add and subtract rational expressions with like denominators Add and subtract rational expressions with unlike denominators Use the multiplication counting principle Find permutations Use strategies to become informed about the situation (e.g., listing information; examine the table for patterns; create a scatter plot to look for patterns; asking questions). Summarize the problem (e.g., there are Olympic winning times over the past 50 years; both men's and women's times are decreasing; will there come a time when women run faster than men). Determine whether enough information is given to find a solution (e.g., list what is needed to be found; extend the pattern to see if women's times will be less). Determine whether information is missing or extraneous (e.g., compare the list of known things to the list of needed things to see</p>		<p>Implement the plan devised to solve the problem (e.g., solve the set of simultaneous equations to arrive at a time where the two times are the same). Use mathematics to solve the problem (e.g., use algebra to write equations for the two linear models, solve the system of equations using either symbols or technology). Identify when an approach is unproductive and modify or try a new approach (e.g., if the result does not make sense in the context, return to the plan to see if something has gone wrong and adjust accordingly). Check the solution to see if it works (e.g., the solution may be a partial year [i.e., 2003.6]; decide how to deal with this and also if the year is reasonable [i.e., 1925 does not make sense given the context]).</p>	<p>2.2.2</p>
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	<p>if there are things that are not needed).</p> <p>Define the problem (e.g., if the pattern continues in the same fashion, will women run faster than men and, if so, when will that occur).</p> <p>Organize relevant information from multiple sources (e.g., create a list of known and unknown information; create a scatter plot of men’s and women’s times vs. time on the same coordinate axis to analyze the patterns).</p> <p>Select and apply appropriate mathematical tools to devise a strategy in a situation (e.g., if the data, in either tabular or graphical form, suggest a linear relationship, plan to find a linear equation for each set of data; solve those equations simultaneously [or use technology to find the intersection of the two lines] to answer the question). If the data pattern suggests a non-linear model, plan to project what the pattern is and extend that pattern.</p> <p>Implement the plan devised to solve the problem (e.g., solve the set of simultaneous equations to arrive at a time where the two times are the same).</p> <p>Use mathematics to solve the problem (e.g., use algebra to write equations for the two linear models, solve the system of equations using either symbols or technology).</p> <p>Identify when an approach is unproductive and modify or try a new approach (e.g., if the result does not make sense in the context, return to the plan to see if something has gone wrong and adjust accordingly).</p> <p>Check the solution to see if it works (e.g., the solution may be a partial year [i.e., 2003.6]; decide how to deal with this and also if the year is reasonable [i.e., 1925 does not make sense given the context]).</p>			
Reasoning	<p>Use deductive reasoning</p> <p>Identify Properties</p> <p>Use deductive reasoning</p> <p>Solve equations using addition and subtraction</p> <p>Solve equations using multiplication and division</p> <p>Solve two-step equations</p> <p>Use the Distributive Property when combining like terms</p> <p>Use the Distributive Property when solving equations</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response</p>	<p>Identify trends in a set of data in order to make a prediction based on the information. (1.4.6)</p> <p>Use statistics to support different points of view. (1.4.6)</p> <p>Examine claims and supporting arguments based on data and make needed revisions. (1.4.6)</p> <p>Examine a set of data, research other sources to see if the data is consistent, find articles written to see if the data makes sense, to</p>	<p>3.2.2</p> <p>3.2.3</p> <p>3.3.2</p>

	<p>Solve equations with variables on both sides</p> <p>Identify equations that are identities or have no solution</p> <p>Find theoretical probability</p> <p>Find experimental probability</p> <p>Find the probability of independent events</p> <p>Find the probability of dependent events</p> <p>Identify relations and functions</p> <p>Evaluate functions</p> <p>Model functions using rules, tables, and graphs</p> <p>Use inductive reasoning in continuing number patterns</p> <p>Write rules for arithmetic sequences</p> <p>Translate the graph of an absolute value equation</p> <p>Find the square of a binomial</p> <p>Find the difference of squares</p> <p>Use the quadratic formula when solving quadratic equations</p> <p>Choose an appropriate method for solving a quadratic equation</p> <p>Find the number of solutions of a quadratic</p> <p>Identify trends in a set of data in order to make a prediction based on the information. (1.4.6)</p> <p>Use statistics to support different points of view. (1.4.6)</p> <p>Examine claims and supporting arguments based on data and make needed revisions. (1.4.6)</p> <p>Examine a set of data, research other sources to see if the data is consistent, find articles written to see if the data makes sense, to develop a logical point of view and to support that view. (1.4.6)</p>	<p>questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>develop a logical point of view and to support that view. (1.4.6)</p>	
Communication	<p>Model relationships with variables</p> <p>Model relationships with equations and formulas</p> <p>Simplify and evaluate expressions and formulas</p> <p>Evaluate expressions containing grouping symbols</p> <p>Classify numbers</p> <p>Compare numbers</p> <p>Add real numbers using models and rules</p> <p>Apply addition</p> <p>Multiply real numbers</p> <p>Divide real numbers</p> <p>Identify properties</p> <p>Use deductive reasoning</p> <p>Solve two-step equations</p> <p>Solve equations with variables on both sides</p> <p>Identify equations that are identities or have no solution</p> <p>Use the Distributive Property when combining like terms</p> <p>Use the Distributive Property when solving equations</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Collect data efficiently on the outcomes of first events and later events to determine and justify how the first event affects the probability of later events (e.g., drawing cards from a deck with or without replacement). (1.4.1)</p> <p>State possible factors that may influence a trend but not be reflected in the data (e.g., population growth of deer vs. availability of natural resources or hunting permits). (1.4.6)</p> <p>Explain how division of measurements produces a derived unit of measurement (e.g., miles traveled divided by hours traveled yields the derived unit [miles per hour]). (1.2.2)</p> <p>Describe the location of points that satisfy given conditions (e.g., the set of points equidistant from a given point; a point equidistant from a given set of points). (1.3.3)</p> <p>Explain the relationship between</p>	<p>4.1.1</p> <p>4.1.2</p> <p>4.2.2</p>

	<p>Define a variable in terms of another variable</p> <p>Model distance-rate-time problems</p> <p>Find mean, median, and mode</p> <p>Make and use stem-and-leaf plots</p> <p>Use proportions when solving percent problems</p> <p>Write and solve percent equations</p> <p>Identify relations and functions</p> <p>Evaluate functions</p> <p>Model functions using rules, tables, and graphs</p> <p>Write a function rule given a table or a real-world situation</p> <p>Write the equation of a direct variation</p> <p>Use ratios and proportions with direct variations</p> <p>Graph equations using intercepts</p> <p>Write equations in standard form</p> <p>Graph and write linear equations using point-slope form</p> <p>Write a linear equation using data</p> <p>Solve systems by graphing</p> <p>Analyze special types of systems</p> <p>Solve systems using substitution</p> <p>Solve systems by adding or subtracting</p> <p>Multiply first when solving systems</p> <p>Write systems of linear equations</p> <p>Solve systems of linear inequalities by graphing</p> <p>Model real-world situations using systems of linear inequalities</p> <p>Simplify expressions with zero and negative exponents</p> <p>Evaluate exponential expressions</p> <p>Write numbers in scientific and standard notation</p> <p>Use scientific notation</p> <p>Multiply powers</p> <p>Work with scientific notation</p> <p>Evaluate exponential functions</p> <p>Graph exponential functions</p> <p>Model exponential growth</p> <p>Model exponential decay</p> <p>Describe polynomials</p> <p>Add and subtract polynomials</p> <p>Multiply a polynomial by a monomial</p> <p>Factor a monomial from a polynomial</p> <p>Multiply binomials using FOIL</p> <p>Multiply trinomials by binomials</p> <p>Find the square of a binomial</p> <p>Find the difference of squares</p> <p>Factor trinomials</p> <p>Factor trinomials of the type $ax^2 + bx + c$</p> <p>Factor perfect-square trinomials</p> <p>Factor the difference of squares</p> <p>Factor polynomials with four terms</p> <p>Factor trinomials by grouping</p> <p>Graph quadratic functions of the form $y = ax^2$</p> <p>Graph quadratic functions of the form $y = ax^2 + c$</p> <p>Graph quadratic functions of the</p>		<p>theoretical probability and empirical frequency of dependent events using simulations with and without technology. (1.4.2)</p>	
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	<p>form $y = ax^2 + bx + c$ Graph quadratic inequalities Simplify radicals involving products Simplify radicals involving quotients Graph square root functions Translate graphs of square root functions Find trigonometric ratios Solve problems using trigonometric ratios Solve inverse variations Compare direct and inverse variation Graph rational functions Identify types of functions Simplify rational expressions Multiply rational expressions Divide rational expressions Add and subtract rational expressions with like denominators Add and subtract rational expressions with unlike denominators Solve rational equations Solve rational proportions Use the multiplication counting principle Find permutations Find combinations Find probability with counting techniques Collect data efficiently on the outcomes of first events and later events to determine and justify how the first event affects the probability of later events (e.g., drawing cards from a deck with or without replacement). (1.4.1) State possible factors that may influence a trend but not be reflected in the data (e.g., population growth of deer vs. availability of natural resources or hunting permits). (1.4.6) Explain how division of measurements produces a derived unit of measurement (e.g., miles traveled divided by hours traveled yields the derived unit [miles per hour]). (1.2.2) Describe the location of points that satisfy given conditions (e.g., the set of points equidistant from a given point; a point equidistant from a given set of points). (1.3.3) Explain the relationship between theoretical probability and empirical frequency of dependent events using simulations with and without technology. (1.4.2)</p>			
Connections	<p>Simplify and evaluate expressions and formulas Evaluate expressions containing grouping symbols Classify numbers Compare numbers Add real numbers using models and rules</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps</p>	<p>Estimate derived units of measure (e.g., miles per hour, people/year, grams/cubic centimeters). (1.2.6) Identify, interpret, and use the meaning of slope of a line as a rate of change using concrete, symbolic, and technological models. (1.2.2)</p>	<p>5.1.1 5.1.2</p>

	<p>Apply addition Subtract real numbers Apply subtraction Multiply real numbers Divide real numbers Use the Distributive Property Simplify algebraic expressions Identify solutions of inequalities Graph and write inequalities Use addition to solve inequalities Use subtraction to solve inequalities Use multiplication to solve inequalities Use division to solve inequalities Solve and graph inequalities containing "and" Solve and graph inequalities containing "or" Solve equations that involve absolute value Solve inequalities that involve absolute value Find ratios and rates Solve proportions Find percent of change Find percent of error Find the probability of independent events Find the probability of dependent events Interpret, sketch, and analyze graphs from situations Write a function rule given a table or a real-world situation Find rates of change from tables and graphs Find slope Write linear equations in slope-intercept form Graph linear equations Graph equations using intercepts Write equations in standard form Graph and write linear equations using point-slope form Write a linear equation using data Determine whether lines are parallel Determine whether lines are perpendicular Solve systems using substitution Solve systems by adding or subtracting Multiply first when solving systems Write systems of linear equations Graph linear inequalities Use linear inequalities when modeling real-world situations Solve systems of linear inequalities by graphing Model real-world situations using systems of linear inequalities Write numbers in scientific and standard notation Use scientific notation Multiply powers Work with scientific notation Use geometric sequences Use formulas when describing</p>	<p>Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Find the equation of a line in a variety of ways (e.g., from a table, graph, slope-intercept, point-slope, two points). (1.5.1) Find the solution to a system of linear equations using tables, graphs and symbols. (1.5.6) Justify a prediction or an inference based on a set of data. (1.4.6) Create a physical activity plan that results in a specified number of calories over a specified time. [PE] Explain a method for determining whether a real world problem involves direct proportion or inverse proportion. (1.1.4) Represent situations on a coordinate grid or describe the location of points that satisfy given conditions (e.g., locate a gas station to be equidistant from given cities; locate a staking point to maximize the grazing area of a tethered goat). (1.3.3)</p>	<p>5.2.1</p> <p>5.3.1</p>
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	<p>geometric sequences Find the square of a binomial Find the difference of squares Graph quadratic functions of the form $y = ax^2$ Graph quadratic functions of the form $y = ax^2 + c$ Graph quadratic functions of the form $y = ax^2 + bx + c$ Graph quadratic inequalities Find square roots Estimate and use square roots Solve quadratic equations by graphing Solve quadratic equations using square roots Solve quadratic equations by factoring Solve quadratic equations by completing the square Use the quadratic formula when solving quadratic equations Choose an appropriate method for solving a quadratic equation Find the number of solutions of a quadratic equation Choose a linear, quadratic, or exponential model for data Solve inverse variations Compare direct and inverse variation Graph rational functions Identify types of functions Simplify rational expressions Divide polynomials Add and subtract rational expressions with like denominators Add and subtract rational expressions with unlike denominators Solve rational equations Solve rational proportions Find combinations Find probability with counting techniques Estimate derived units of measure (e.g., miles per hour, people/year, grams/cubic centimeters). (1.2.6) Identify, interpret, and use the meaning of slope of a line as a rate of change using concrete, symbolic, and technological models. (1.2.2) Find the equation of a line in a variety of ways (e.g., from a table, graph, slope-intercept, point-slope, two points). (1.5.1) Find the solution to a system of linear equations using tables, graphs and symbols. (1.5.6) Justify a prediction or an inference based on a set of data. (1.4.6) Create a physical activity plan that results in a specified number of calories over a specified time. [PE] Explain a method for determining</p>			
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	<p>whether a real world problem involves direct proportion or inverse proportion. (1.1.4) Represent situations on a coordinate grid or describe the location of points that satisfy given conditions (e.g., locate a gas station to be equidistant from given cities; locate a staking point to maximize the grazing area of a tethered goat). (1.3.3)</p>			
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Tenth Grade GEOMETRY

Tenth Grade	Introduced/Practiced During Year	Delivery Methods	Year-end Proficiencies	State GLEs
Number Sense	<p>Use direct or inverse proportion to determine a number of objects or a measurement in a given situation. Write ratios and solve proportions</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Use direct or inverse proportion to determine a number of objects or a measurement in a given situation.</p>	1.1.4
Measurement	<p>Find the lengths of segments Find the measures of angles Find perimeters of rectangles and squares, and circumferences of circles Find areas of rectangles, squares, and circles Find the area of a parallelogram Find the area of a triangle Find the area of a trapezoid Find the area of a rhombus or kite Find the area of a regular polygon Use the Pythagorean Theorem Use the Converse of the Pythagorean Theorem Find the measures of central angles and arcs Find circumference and arc length Find the areas of circles, sectors, and segments of circles Find the perimeters and areas of similar figures Use tangent ratios to determine side lengths in triangles Use sine and cosine ratios to determine side lengths in triangles Find the area of a regular polygon using trigonometry Find the area of a triangle using trigonometry Find the surface area of a prism Find the surface area of a cylinder Use a formula to find the volume of a prism or cylinder. [RL, MC] Find the surface area of a pyramid Find the surface area of a cone Find the volume of a pyramid Find the volume of a cone Find the surface area and volume of a sphere Find the measure of an inscribed angle Find the measure of an angle formed by a tangent and a chord Find the measures of angles formed by chords, secants, and tangents</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Describe and compare the impact that a change in one or more dimensions has on objects (e.g., how doubling one dimension of a cube affects the surface area and volume). [CU, MC] Describe how changes in the dimensions of objects affect perimeter, area, and volume in real world situations (e.g., how does the change in the diameter of an oil drum affect the area and volume). [CU, MC] Solve problems by deriving the changes in two dimensions necessary to obtain a desired surface area and/or volume (e.g., given a box with certain dimensions, make the volume of the box y cubic units by changing two dimensions of the box). [SP] Compare a given change in one or two dimensions on the perimeter, area, surface areas, or volumes of two objects. Determine the change in one dimension given a change in perimeter, area, volume, or surface area. Understand how to convert units of measure within U.S. or within metric systems to achieve an appropriate level of precision. Convert to a larger unit within a system while maintaining the same level of precision (e.g., represent 532 centimeters to 5.32 meters). Convert to a smaller unit within a system to increase the precision of a derived unit of measurement. Explain how to use a formula for finding the volume of a prism or cylinder. [CU, MC] Use a formula to find the volume of a prism or cylinder. [RL, MC]</p>	<p>1.2.1</p> <p>1.2.3</p> <p>1.2.5</p>

	<p>Find the lengths of segments associated with circles Find the center and radius of a circle Describe and compare the impact that a change in one or more dimensions has on objects (e.g., how doubling one dimension of a cube affects the surface area and volume). [CU, MC] Describe how changes in the dimensions of objects affect perimeter, area, and volume in real world situations (e.g., how does the change in the diameter of an oil drum affect the area and volume). [CU, MC] Solve problems by deriving the changes in two dimensions necessary to obtain a desired surface area and/or volume (e.g., given a box with certain dimensions, make the volume of the box y cubic units by changing two dimensions of the box). [SP] Compare a given change in one or two dimensions on the perimeter, area, surface areas, or volumes of two objects. Determine the change in one dimension given a change in perimeter, area, volume, or surface area. Understand how to convert units of measure within U.S. or within metric systems to achieve an appropriate level of precision. Convert to a larger unit within a system while maintaining the same level of precision (e.g., represent 532 centimeters to 5.32 meters). Convert to a smaller unit within a system to increase the precision of a derived unit of measurement. Explain how to use a formula for finding the volume of a prism or cylinder. [CU, MC] Use a formula to derive a dimension of a right prism or right cylinder given other measures. Use formulas to describe and compare the surface areas and volumes of two or more right prisms and/or right cylinders. [RL] Use formulas to obtain measurements needed to describe a right cylinder or right prism. Apply a process that can be used to find a reasonable estimate for the volume of prisms, pyramids, cylinders, and cones. Estimate volume and surface area for right cylinders and right prisms.</p>		<p>Use a formula to derive a dimension of a right prism or right cylinder given other measures. Use formulas to describe and compare the surface areas and volumes of two or more right prisms and/or right cylinders. [RL] Use formulas to obtain measurements needed to describe a right cylinder or right prism. Apply a process that can be used to find a reasonable estimate for the volume of prisms, pyramids, cylinders, and cones. Estimate volume and surface area for right cylinders and right prisms.</p>	1.2.6
Geometric Sense	Understand basic terms and postulates of geometry	Lecture Modeling	Identify and label one- and two-dimensional characteristics (rays,	1.3.1

	<p>Identify and label one- and two-dimensional characteristics (rays, lines, end points, line segments, vertices, and angles) in three-dimensional figures. [CU] Describe everyday objects in terms of their geometric characteristics. [CU] Draw a plane shape and justify the answer given a set of characteristics. [RL, CU] Describe or classify various shapes based on their characteristics.</p> <p>Identify segments and rays Recognize parallel lines Identify angle pairs Identify angles formed by two lines and a transversal Classify polygons Classify triangles and find the measures of their angles Define and classify special types of quadrilaterals Determine whether a quadrilateral is a parallelogram Describe vectors</p> <p>Construct geometric figures using a variety of tools and technologies (e.g., angle bisectors, perpendicular bisectors, triangles given specific characteristics). [MC] Use a compass and a straightedge to construct congruent angles Use a compass and a straightedge to bisect segments and angles Construct parallel lines Construct perpendicular lines</p> <p>Use geometric properties and relationships to describe, compare, and draw two-dimensional and three-dimensional shapes and figures. Recognize conditions that result in parallel lines Identify properties of perpendicular bisectors and angle bisectors Identify properties of medians and altitudes of a triangle Graph lines given their equations Relate slope and parallel lines Relate slope and perpendicular lines Recognize congruent figures and their corresponding parts Identify congruent overlapping triangles Identify and apply similar polygons Recognize properties of lines through the center of a circle</p> <p>Use the properties of two-dimensional and three-dimensional shapes to solve mathematical problems (e.g., find the width of a river based on similar triangles; given a set of parallel lines, a transversal, and</p>	<p>Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>lines, end points, line segments, vertices, and angles) in three-dimensional figures. [CU] Match or draw three-dimensional objects from different perspectives using the same properties and relationships (e.g., match to the correct net, draw the top view). [RL] Draw and label with names and symbols nets of right prisms and right cylinders. [RL, CU] Describe everyday objects in terms of their geometric characteristics. [CU] Describe or classify various shapes based on their characteristics. Use geometric properties and relationships to describe, compare, and draw two-dimensional and three-dimensional shapes and figures. Construct geometric figures using a variety of tools and technologies (e.g., angle bisectors, perpendicular bisectors, triangles given specific characteristics). [MC] Draw a plane shape and justify the answer given a set of characteristics. [RL, CU] Use the properties of two-dimensional and three-dimensional shapes to solve mathematical problems (e.g., find the width of a river based on similar triangles; given a set of parallel lines, a transversal, and an angle, find the other angles). [SP, RL, CU, MC] Compare two-dimensional and three-dimensional shapes according to characteristics including faces, edges, and vertices, using actual and virtual modeling. [RL, CU] Use technology to generate two and three dimensional models of geometric figures with given geometric characteristics (e.g., generate a two-dimensional animation using pentagons with fixed coordinates for one edge). [RL, SP] Create a three-dimensional scale drawing with particular geometric characteristics. [SP, CU, MC] Describe geometric characteristics of two-dimensional objects using coordinates on a grid. [MC] Describe (and draw) the location of points that satisfy given conditions (e.g., the set of points equidistant from a given point; a point equidistant from a given set</p>	<p>1.3.2</p> <p>1.3.3</p>
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	<p>an angle, find the other angles). [SP, RL, CU, MC] Use and apply properties of isosceles triangles Use properties of midsegments to solve problems Use properties of perpendicular bisectors and angle bisectors Use relationships among sides and among angles of parallelograms Use relationships involving diagonals of parallelograms or transversal Relate exterior angles to the angles of a triangle Find the sums of the measures of the interior and exterior angles of polygons Use properties of diagonals of rhombuses and rectangles Determine whether a parallelogram is a rhombus or a rectangle Verify and use properties of trapezoids and kites Use properties of 45-45-90 triangles Use properties of 30-60-90 triangles Use AA, SAS, and SSS similarity statements Apply AA, SAS, and SSS similarity statements Find and use relationships in similar right triangles Use the Side-Splitter Theorem Use the Triangle-Angle-Bisector Theorem Use the relationship between a radius and a tangent Use the relationship between two tangents from one point Use congruent chords, arcs, and central angles Describe geometric characteristics of two-dimensional objects using coordinates on a grid. [MC] Find the distance between two points in the coordinate plane Find the coordinates of the midpoint of a segment in the coordinate plane Name coordinates of special figures by using their properties Match or draw three-dimensional objects from different perspectives using the same properties and relationships (e.g., match to the correct net, draw the top view). [RL] Draw and label with names and symbols nets of right prisms and right cylinders. [RL, CU] Make isometric and orthographic drawings Describe cross sections of three-dimensional figures Identify isometries Compare two-dimensional and three-dimensional shapes according to characteristics</p>		<p>of points). [CU] Apply multiple transformations to create congruent and similar figures in any or all of the four quadrants. Use multiple transformations (combinations of translations, reflections, or rotations) to draw an image. [RL] Use dilation (expansion or contraction) of a given shape to form a similar shape. [RL, CU] Determine the final coordinates of a point after a series of transformations. [RL, CU] Examine figures to determine rotational symmetry about the center of the shape. [RL, MC] Define a set of transformations that would map one onto the other given two similar shapes. [SP, RL] Create a design with or without technology using a combination of two or more transformations with one or two two-dimensional figures. [SP, RL] Use technology to create two- and three-dimensional animations using combinations of transformations. [MC, SP, RL]</p>	<p>1.3.4</p>
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	<p>including faces, edges, and vertices, using actual and virtual modeling. [RL, CU]</p> <p>Use technology to generate two and three dimensional models of geometric figures with given geometric characteristics (e.g., generate a two-dimensional animation using pentagons with fixed coordinates for one edge). [RL, SP]</p> <p>Create a three-dimensional scale drawing with particular geometric characteristics. [SP, CU, MC]</p> <p>Describe (and draw) the location of points that satisfy given conditions (e.g., the set of points equidistant from a given point; a point equidistant from a given set of points). [CU]</p> <p>Apply multiple transformations to create congruent and similar figures in any or all of the four quadrants.</p> <p>Use multiple transformations (combinations of translations, reflections, or rotations) to draw an image. [RL]</p> <p>Find reflection images of figures Describe translations using vectors Find translation images using matrix and vector sums Draw and identify rotation images of figures Use a composition of reflections Identify glide reflections</p> <p>Use dilation (expansion or contraction) of a given shape to form a similar shape. [RL, CU]</p> <p>Determine the final coordinates of a point after a series of transformations. [RL, CU]</p> <p>Examine figures to determine rotational symmetry about the center of the shape. [RL, MC]</p> <p>Identify the type of symmetry in a figure</p> <p>Define a set of transformations that would map one onto the other given two similar shapes. [SP, RL]</p> <p>Create a design with or without technology using a combination of two or more transformations with one or two two-dimensional figures. [SP, RL]</p> <p>Use technology to create two- and three-dimensional animations using combinations of transformations. [MC, SP, RL]</p> <p>Identify transformations in tessellations and figures that will tessellate Identify symmetries of tessellations</p>			
Probability and Statistics	<p>Use segment and area models to find the probabilities of events</p> <p>Determine the equation for a</p>	Lecture Modeling Drill and practice	Determine the equation for a reasonable line to describe a set of bivariate data. [RL, MC]	1.4.4

	<p>reasonable line to describe a set of bivariate data. [RL, MC] Determine the equation of a line that fits the data displayed on a scatter plot. [SP, RL] Use technology to determine the line of best fit for a set of data. [MC] Match an equation with a set of data. [MC] Match an equation with a graphic display. [MC] Create a graph based on the equation for the line.</p>	<p>Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Determine the equation of a line that fits the data displayed on a scatter plot. [SP, RL] Use technology to determine the line of best fit for a set of data. [MC] Match an equation with a set of data. [MC] Match an equation with a graphic display. [MC] Create a graph based on the equation for the line.</p>	
Algebraic Sense	<p>Write equations of lines Use inequalities involving angles of triangles Use inequalities involving sides of triangles Use angles of elevation and depression to solve problems Solve problems that involve vector addition Find relationships between the ratios of the areas and volumes of similar solids Write an equation of a circle Simplify expressions and evaluate formulas involving exponents. Rearrange formulas to solve for a particular variable (e.g., given $A = .5bh$, solve for h). [MC, CU]</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Simplify expressions and evaluate formulas involving exponents. Rearrange formulas to solve for a particular variable (e.g., given $A = .5bh$, solve for h). [MC, CU]</p>	<p>1.5.5 1.5.6</p>
Problem Solving	<p>Use inductive reasoning to make conjectures Understand basic terms and postulates of geometry Identify segments and rays Recognize parallel lines Find the lengths of segments Find the measures of angles Use a compass and a straightedge to construct congruent segments and congruent angles Use a compass and a straightedge to bisect segments and angles Find the distance between two points in the coordinate plane Find the coordinates of the midpoint of a segment in the coordinate plane Find perimeters of rectangles and squares, and circumferences of circles Find areas of rectangles, squares, and circles Recognize conditional statements Write converses of conditional statements Write biconditionals Recognize good definitions Use the Law of Detachment Use the Law of Syllogism Connect reasoning in algebra and geometry Identify angle pairs</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>		

	<p>Prove and apply theorems about angles</p> <p>Identify angles formed by two lines and a transversal</p> <p>Prove and use properties of parallel lines</p> <p>Recognize conditions that result in parallel lines</p> <p>Construct parallel lines</p> <p>Construct perpendicular lines</p> <p>Classify triangles and find the measures of their angles</p> <p>Relate exterior angles to the angles of a triangle</p> <p>Classify polygons</p> <p>Find the sums of the measures of the interior and exterior angles of polygons</p> <p>Graph lines given their equations</p> <p>Write equations of lines</p> <p>Relate slope and parallel lines</p> <p>Relate slope and perpendicular lines</p> <p>Recognize congruent figures and their corresponding parts</p> <p>Prove two triangles are congruent using the SSS and SAS Postulates</p> <p>Prove two triangles are congruent using the ASA Postulate and the AAS Theorem</p> <p>Use triangle congruence and CPCTC to prove that parts of two triangles are congruent</p> <p>Use and apply properties of isosceles triangles</p> <p>Prove triangles congruent using the HL Theorem</p> <p>Identify congruent overlapping triangles</p> <p>Prove two triangles congruent by first proving two other triangles congruent</p> <p>Use properties of midsegments to solve problems</p> <p>Use properties of perpendicular bisectors and angle bisectors</p> <p>Identify properties of perpendicular bisectors and angle bisectors</p> <p>Identify properties of medians and altitudes of a triangle</p> <p>Write the negation of a statement and the inverse and contrapositive of a conditional statement</p> <p>Use indirect reasoning</p> <p>Use inequalities involving angles of triangles</p> <p>Use inequalities involving sides of triangles</p> <p>Use relationships among sides and among angles of parallelograms</p> <p>Use relationships involving diagonals of parallelograms or transversals</p> <p>Determine whether a quadrilateral is a parallelogram</p> <p>Use properties of diagonals of rhombuses and rectangles</p> <p>Determine whether a parallelogram is a rhombus or a rectangle</p>			
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	<p>Verify and use properties of trapezoids and kites</p> <p>Prove theorems using figures in the coordinate plane</p> <p>Find the area of a parallelogram</p> <p>Find the area of a triangle</p> <p>Find the area of a trapezoid</p> <p>Find the area of a rhombus or a kite</p> <p>Find the area of a regular polygon</p> <p>Use the Pythagorean Theorem</p> <p>Use the Converse of the Pythagorean Theorem</p> <p>Use properties of 45-45-90 triangles</p> <p>Use properties of 30-60-90 triangles</p> <p>Find the measures of central angles and arcs</p> <p>Find circumference and arc length</p> <p>Find the areas of circles, sectors, and segments of circles</p> <p>Use segment and area models to find the probabilities of events</p> <p>Write ratios and solve proportions</p> <p>Identify and apply similar polygons</p> <p>Use AA, SAS, and SSS similarity statements</p> <p>Apply AA, SAS, and SSS similarity statements</p> <p>Find and use relationships in similar right triangles</p> <p>Use the Side-Splitter Theorem</p> <p>Use the Triangle-Angle-Bisector Theorem</p> <p>Find the perimeters and areas of similar figures</p> <p>Use tangent ratios to determine side lengths in a triangle</p> <p>Use sine and cosine to determine side lengths in triangles</p> <p>Use angle of elevation and depression to solve problems</p> <p>Describe vectors</p> <p>Solve problems that involve vector addition</p> <p>Find the area of a regular polygon using trigonometry</p> <p>Find the area of a triangle using trigonometry</p> <p>Recognize nets of space figures</p> <p>Make isometric and orthographic drawings</p> <p>Describe cross sections of three-dimensional figures</p> <p>Find the surface area of a prism</p> <p>Find the surface area of a cylinder</p> <p>Find the volume of a prism</p> <p>Find the volume of a cylinder</p> <p>Find the surface area of a pyramid</p> <p>Find the surface area of a cone</p> <p>Find the volume of a pyramid</p> <p>Find the volume of a cone</p> <p>Find the surface area and volume of a sphere</p> <p>Find relationships between the ratios of the areas and volumes of similar solids</p> <p>Use the relationship between a radius and a tangent</p>			
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	<p>Use the relationship between two tangents from one point</p> <p>Use congruent chords, arcs, and central angles</p> <p>Recognize properties of lines through the center of a circle</p> <p>Find the measure of an inscribed angle</p> <p>Find the measure of an angle formed by a tangent and a chord</p> <p>Find the measures of the angles formed by chords, secants, and tangents</p> <p>Find the lengths of segments associated with circles</p> <p>Write an equation of a circle</p> <p>Find the center and radius of a circle</p> <p>Draw and describe a locus</p> <p>Identify isometries</p> <p>Find reflection images of figures</p> <p>Describe translations using vectors</p> <p>Find translation images using matrix and vector sums</p> <p>Draw and identify rotation images of figures</p> <p>Use a composition of reflections</p> <p>Identify glide reflections</p> <p>Identify the type of symmetry in a figure</p> <p>Identify transformations in tessellations and figures that will tessellate</p> <p>Identify symmetries of tessellations</p> <p>Locate dilation images of figures</p>			
Reasoning	<p>Use inductive reasoning to make conjectures</p> <p>Recognize conditional statements</p> <p>Write converses of conditional statements</p> <p>Write biconditionals</p> <p>Recognize good definitions</p> <p>Use the Law of Detachment</p> <p>Use the Law of Syllogism</p> <p>Connect reasoning in algebra and geometry</p> <p>Prove and apply theorems about angles</p> <p>Prove and use properties of parallel lines</p> <p>Prove two triangles congruent using the SSS and SAS Postulates</p> <p>Prove two triangles congruent using the ASA and AAS Postulates</p> <p>Use triangle congruence and CPCTC to prove that parts of two triangles are congruent</p> <p>Prove triangles congruent using the HL Theorem</p> <p>Prove two triangles congruent by first proving two other triangles congruent</p> <p>Write the negation of a statement and the inverse and contrapositive of a conditional statement</p> <p>Use indirect reasoning</p> <p>Prove theorems using figures in the</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Use the properties of two-dimensional and three-dimensional figures to solve mathematical problems (e.g., find the width of a river based on similar triangles; given a set of parallel lines, a transversal, and an angle, find the other angles). Make and test conjectures about two-dimensional and three-dimensional figures and their individual attributes and relationships using physical, symbolic, and technological models (e.g., diagonal of a rectangle or prism is the longest interior segment; what figures make up cross-sections of a given three-dimensional shape). (1.3.1)</p> <p>Compare and describe the volume of cylinders, cones, and prisms when an attribute is changed (e.g., the area of the base, the height of solid). (1.2.4)</p> <p>Draw a plane shape of a given set of characteristics and justify the answer. (1.3.2)</p> <p>Compare and contrast similar two-dimensional figures and shapes using properties of two-dimensional figures and shapes. (1.3.2)</p>	<p>3.1.1</p> <p>3.2.1</p> <p>3.2.2</p> <p>3.3.1</p>

	<p>coordinate plane Use inductive reasoning to make conjectures Understand basic terms and postulates of geometry Find the lengths of segments Find the measures of angles Recognize conditional statements Write converses of conditional statements Write biconditionals Recognize good definitions Use the Law of Detachment Use the Law of Syllogism Connect reasoning in algebra and geometry Identify angle pairs Prove and apply theorems about angles Identify angles formed by two lines and a transversal Prove and use properties of parallel lines Recognize conditions that result in parallel lines Classify triangles and find the measures of their angles Relate exterior angles to the angles of a triangle Classify polygons Find the sums of the measures of the interior and exterior angles of polygons Recognize congruent figures and their corresponding parts Prove two triangles are congruent using the SSS and SAS Postulates Prove two triangles are congruent using the ASA Postulate and the AAS Theorem Use triangle congruence and CPCTC to prove that parts of two triangles are congruent Use and apply properties of isosceles triangles Prove triangles congruent using the HL Theorem Identify congruent overlapping triangles Prove two triangles congruent by first proving two other triangles congruent Use properties of midsegments to solve problems Use properties of perpendicular bisectors and angle bisectors Write the negation of a statement and the inverse and contrapositive of a conditional statement Use indirect reasoning Use inequalities involving angles of triangles Use inequalities involving sides of triangles Define and classify special types of quadrilaterals Use relationships among sides and</p>		<p>Find a reasonable estimate for the volume of prisms, pyramids, cylinders, and cones. (1.2.6)</p>	
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	<p>among angles of parallelograms Use relationships involving diagonals of parallelograms or transversals Determine whether a quadrilateral is a parallelogram Use properties of diagonals of rhombuses and rectangles Determine whether a parallelogram is a rhombus or a rectangle Verify and use properties of trapezoids and kites Name coordinates of special figures by using their properties Prove theorems using figures in the coordinate plane Find the area of a regular polygon Use the Pythagorean Theorem Use the Converse of the Pythagorean Theorem Find the measures of central angles and arcs Find circumference and arc length Find the areas of circles, sectors, and segments of circles Use segment and area models to find the probabilities of events Use AA, SAS, and SSS similarity statements Apply AA, SAS, and SSS similarity statements Find and use relationships in similar right triangles Use the Side-Splitter Theorem Use the Triangle-Angle-Bisector Theorem Find the perimeters and areas of similar figures Use tangent ratios to determine side lengths in a triangle Use angle of elevation and depression to solve problems Find the volume of a prism Find the volume of a cylinder Find the volume of a pyramid Find the volume of a cone Use the relationship between a radius and a tangent Use the relationship between two tangents from one point Use congruent chords, arcs, and central angles Recognize properties of lines through the center of a circle Find the measure of an inscribed angle Find the measure of an angle formed by a tangent and a chord Find the measures of the angles formed by chords, secants, and tangents Find the lengths of segments associated with circles Write an equation of a circle Find the center and radius of a circle Use the properties of two-dimensional and three-dimensional figures to solve</p>			
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	<p>mathematical problems (e.g., find the width of a river based on similar triangles; given a set of parallel lines, a transversal, and an angle, find the other angles). Make and test conjectures about two-dimensional and three-dimensional figures and their individual attributes and relationships using physical, symbolic, and technological models (e.g., diagonal of a rectangle or prism is the longest interior segment; what figures make up cross-sections of a given three-dimensional shape). (1.3.1)</p> <p>Compare and describe the volume of cylinders, cones, and prisms when an attribute is changed (e.g., the area of the base, the height of solid). (1.2.4)</p> <p>Draw a plane shape of a given set of characteristics and justify the answer. (1.3.2)</p> <p>Compare and contrast similar two-dimensional figures and shapes using properties of two-dimensional figures and shapes. (1.3.2)</p> <p>Find a reasonable estimate for the volume of prisms, pyramids, cylinders, and cones. (1.2.6)</p>			
Communication	<p>Use inductive reasoning to make conjectures</p> <p>Understand basic terms and postulates of geometry</p> <p>Identify segments and rays</p> <p>Recognize parallel lines</p> <p>Find the lengths of segments</p> <p>Find the measures of angles</p> <p>Use a compass and a straightedge to construct congruent segments and congruent angles</p> <p>Use a compass and a straightedge to bisect segments and angles</p> <p>Find the distance between two points in the coordinate plane</p> <p>Find the coordinates of the midpoint of a segment in the coordinate plane</p> <p>Find perimeters of rectangles and squares, and circumferences of circles</p> <p>Find areas of rectangles, squares, and circles</p> <p>Recognize conditional statements</p> <p>Write converses of conditional statements</p> <p>Write biconditionals</p> <p>Recognize good definitions</p> <p>Use the Law of Detachment</p> <p>Use the Law of Syllogism</p> <p>Connect reasoning in algebra and geometry</p> <p>Identify angle pairs</p> <p>Prove and apply theorems about angles</p>	<p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Develop an argument to support a given point of view and set of statistics. (1.4.6)</p> <p>Describe and compare the impact that a change in one or more dimensions has on objects (e.g., doubling the edge of a cube affects the surface area). (1.2.1)</p>	<p>4.2.1</p> <p>4.2.2</p>

	<p>Identify angles formed by two lines and a transversal</p> <p>Prove and use properties of parallel lines</p> <p>Recognize conditions that result in parallel lines</p> <p>Construct parallel lines</p> <p>Construct perpendicular lines</p> <p>Classify triangles and find the measures of their angles</p> <p>Relate exterior angles to the angles of a triangle</p> <p>Classify polygons</p> <p>Find the sums of the measures of the interior and exterior angles of polygons</p> <p>Graph lines given their equations</p> <p>Write equations of lines</p> <p>Relate slope and parallel lines</p> <p>Relate slope and perpendicular lines</p> <p>Recognize congruent figures and their corresponding parts</p> <p>Prove two triangles are congruent using the SSS and SAS Postulates</p> <p>Prove two triangles are congruent using the ASA Postulate and the AAS Theorem</p> <p>Use triangle congruence and CPCTC to prove that parts of two triangles are congruent</p> <p>Use and apply properties of isosceles triangles</p> <p>Prove triangles congruent using the HL Theorem</p> <p>Identify congruent overlapping triangles</p> <p>Prove two triangles congruent by first proving two other triangles congruent</p> <p>Use properties of midsegments to solve problems</p> <p>Use properties of perpendicular bisectors and angle bisectors</p> <p>Identify properties of perpendicular bisectors and angle bisectors</p> <p>Identify properties of medians and altitudes of a triangle</p> <p>Write the negation of a statement and the inverse and contrapositive of a conditional statement</p> <p>Use indirect reasoning</p> <p>Use inequalities involving angles of triangles</p> <p>Use inequalities involving sides of triangles</p> <p>Define and classify special types of quadrilaterals</p> <p>Use relationships among sides and among angles of parallelograms</p> <p>Use relationships involving diagonals of parallelograms or transversals</p> <p>Determine whether a quadrilateral is a parallelogram</p> <p>Use properties of diagonals of rhombuses and rectangles</p> <p>Determine whether a parallelogram is a rhombus or a rectangle</p>			
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	<p>Verify and use properties of trapezoids and kites</p> <p>Name coordinates of special figures by using their properties</p> <p>Prove theorems using figures in the coordinate plane</p> <p>Find the area of a parallelogram</p> <p>Find the area of a triangle</p> <p>Find the area of a trapezoid</p> <p>Find the area of a rhombus or a kite</p> <p>Find the area of a regular polygon</p> <p>Use the Pythagorean Theorem</p> <p>Use the Converse of the Pythagorean Theorem</p> <p>Use properties of 45-45-90 triangles</p> <p>Use properties of 30-60-90 triangles</p> <p>Find the measures of central angles and arcs</p> <p>Find circumference and arc length</p> <p>Find the areas of circles, sectors, and segments of circles</p> <p>Use segment and area models to find the probabilities of events</p> <p>Write ratios and solve proportions</p> <p>Identify and apply similar polygons</p> <p>Use AA, SAS, and SSS similarity statements</p> <p>Apply AA, SAS, and SSS similarity statements</p> <p>Find and use relationships in similar right triangles</p> <p>Use the Side-Splitter Theorem</p> <p>Use the Triangle-Angle-Bisector Theorem</p> <p>Find the perimeters and areas of similar figures</p> <p>Use tangent ratios to determine side lengths in a triangle</p> <p>Use sine and cosine to determine side lengths in triangles</p> <p>Use angle of elevation and depression to solve problems</p> <p>Describe vectors</p> <p>Solve problems that involve vector addition</p> <p>Find the area of a regular polygon using trigonometry</p> <p>Find the area of a triangle using trigonometry</p> <p>Recognize nets of space figures</p> <p>Make isometric and orthographic drawings</p> <p>Describe cross sections of three-dimensional figures</p> <p>Find the surface area of a prism</p> <p>Find the surface area of a cylinder</p> <p>Find the volume of a prism</p> <p>Find the volume of a cylinder</p> <p>Find the surface area of a pyramid</p> <p>Find the surface area of a cone</p> <p>Find the volume of a pyramid</p> <p>Find the volume of a cone</p> <p>Find the surface area and volume of a sphere</p> <p>Find relationships between the ratios of the areas and volumes of similar solids</p>			
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	<p>Use the relationship between a radius and a tangent</p> <p>Use the relationship between two tangents from one point</p> <p>Use congruent chords, arcs, and central angles</p> <p>Recognize properties of lines through the center of a circle</p> <p>Find the measure of an inscribed angle</p> <p>Find the measure of an angle formed by a tangent and a chord</p> <p>Find the measures of the angles formed by chords, secants, and tangents</p> <p>Find the lengths of segments associated with circles</p> <p>Write an equation of a circle</p> <p>Find the center and radius of a circle</p> <p>Draw and describe a locus</p> <p>Identify isometries</p> <p>Find reflection images of figures</p> <p>Describe translations using vectors</p> <p>Find translation images using matrix and vector sums</p> <p>Draw and identify rotation images of figures</p> <p>Use a composition of reflections</p> <p>Identify glide reflections</p> <p>Identify the type of symmetry in a figure</p> <p>Identify transformations in tessellations and figures that will tessellate</p> <p>Identify symmetries of tessellations</p> <p>Locate dilation images of figures</p> <p>Develop an argument to support a given point of view and set of statistics. (1.4.6)</p> <p>Describe and compare the impact that a change in one or more dimensions has on objects (e.g., doubling the edge of a cube affects the surface area). (1.2.1)</p>			
Connections	<p>Connect reasoning in algebra and geometry</p> <p>Use inductive reasoning to make conjectures</p> <p>Understand basic terms and postulates of geometry</p> <p>Identify segments and rays</p> <p>Recognize parallel lines</p> <p>Find the lengths of segments</p> <p>Find the measures of angles</p> <p>Use a compass and a straightedge to construct congruent segments and congruent angles</p> <p>Use a compass and a straightedge to bisect segments and angles</p> <p>Find the distance between two points in the coordinate plane</p> <p>Find the coordinates of the midpoint of a segment in the coordinate plane</p> <p>Find perimeters of rectangles and squares, and circumferences of</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Determine the final coordinates of a point after a series of transformations. (1.3.4)</p> <p>Construct one-dimensional, two-dimensional, and three-dimensional geometric figures using a variety of tools and technologies (e.g., angle bisectors, perpendicular bisectors, triangles given specific characteristics). (1.3.2)</p> <p>Recognize the mathematical contribution of a person or culture (e.g., create a report or presentation that highlights a mathematical contribution related to current mathematical study). Describe how changes in the dimensions of objects affect perimeter, area, and volume in real-world situations (e.g., how</p>	<p>5.1.1</p> <p>5.1.2</p> <p>5.2.2</p> <p>5.3.1</p>

	<p>circles Find areas of rectangles, squares, and circles Recognize conditional statements Write converses of conditional statements Write biconditionals Recognize good definitions Use the Law of Detachment Use the Law of Syllogism Connect reasoning in algebra and geometry Identify angle pairs Prove and apply theorems about angles Identify angles formed by two lines and a transversal Prove and use properties of parallel lines Recognize conditions that result in parallel lines Construct parallel lines Construct perpendicular lines Classify triangles and find the measures of their angles Relate exterior angles to the angles of a triangle Classify polygons Find the sums of the measures of the interior and exterior angles of polygons Graph lines given their equations Write equations of lines Relate slope and parallel lines Relate slope and perpendicular lines Recognize congruent figures and their corresponding parts Prove two triangles are congruent using the SSS and SAS Postulates Prove two triangles are congruent using the ASA Postulate and the AAS Theorem Use triangle congruence and CPCTC to prove that parts of two triangles are congruent Use and apply properties of isosceles triangles Prove triangles congruent using the HL Theorem Identify congruent overlapping triangles Prove two triangles congruent by first proving two other triangles congruent Use properties of midsegments to solve problems Use properties of perpendicular bisectors and angle bisectors Identify properties of perpendicular bisectors and angle bisectors Identify properties of medians and altitudes of a triangle Write the negation of a statement and the inverse and contrapositive of a conditional statement Use indirect reasoning Use inequalities involving angles of</p>		<p>does the change in the diameter of an oil drum affect the area and volume). (1.2.1) Select a career and research the mathematics necessary to get the job and the mathematics used in the job.</p>	<p>5.3.2</p>
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	<p>triangles</p> <p>Use inequalities involving sides of triangles</p> <p>Define and classify special types of quadrilaterals</p> <p>Use relationships among sides and among angles of parallelograms</p> <p>Use relationships involving diagonals of parallelograms or transversals</p> <p>Determine whether a quadrilateral is a parallelogram</p> <p>Use properties of diagonals of rhombuses and rectangles</p> <p>Determine whether a parallelogram is a rhombus or a rectangle</p> <p>Verify and use properties of trapezoids and kites</p> <p>Name coordinates of special figures by using their properties</p> <p>Prove theorems using figures in the coordinate plane</p> <p>Find the area of a parallelogram</p> <p>Find the area of a triangle</p> <p>Find the area of a trapezoid</p> <p>Find the area of a rhombus or a kite</p> <p>Find the area of a regular polygon</p> <p>Use the Pythagorean Theorem</p> <p>Use the Converse of the Pythagorean Theorem</p> <p>Use properties of 45-45-90 triangles</p> <p>Use properties of 30-60-90 triangles</p> <p>Find the measures of central angles and arcs</p> <p>Find circumference and arc length</p> <p>Find the areas of circles, sectors, and segments of circles</p> <p>Use segment and area models to find the probabilities of events</p> <p>Write ratios and solve proportions</p> <p>Identify and apply similar polygons</p> <p>Use AA, SAS, and SSS similarity statements</p> <p>Apply AA, SAS, and SSS similarity statements</p> <p>Find and use relationships in similar right triangles</p> <p>Use the Side-Splitter Theorem</p> <p>Use the Triangle-Angle-Bisector Theorem</p> <p>Find the perimeters and areas of similar figures</p> <p>Use tangent ratios to determine side lengths in a triangle</p> <p>Use sine and cosine to determine side lengths in triangles</p> <p>Use angle of elevation and depression to solve problems</p> <p>Describe vectors</p> <p>Solve problems that involve vector addition</p> <p>Find the area of a regular polygon using trigonometry</p> <p>Find the area of a triangle using trigonometry</p> <p>Recognize nets of space figures</p> <p>Make isometric and orthographic drawings</p>			
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	<p>Describe cross sections of three-dimensional figures</p> <p>Find the surface area of a prism</p> <p>Find the surface area of a cylinder</p> <p>Find the volume of a prism</p> <p>Find the volume of a cylinder</p> <p>Find the surface area of a pyramid</p> <p>Find the surface area of a cone</p> <p>Find the volume of a pyramid</p> <p>Find the volume of a cone</p> <p>Find the surface area and volume of a sphere</p> <p>Find relationships between the ratios of the areas and volumes of similar solids</p> <p>Use the relationship between a radius and a tangent</p> <p>Use the relationship between two tangents from one point</p> <p>Use congruent chords, arcs, and central angles</p> <p>Recognize properties of lines through the center of a circle</p> <p>Find the measure of an inscribed angle</p> <p>Find the measure of an angle formed by a tangent and a chord</p> <p>Find the measures of the angles formed by chords, secants, and tangents</p> <p>Find the lengths of segments associated with circles</p> <p>Write an equation of a circle</p> <p>Find the center and radius of a circle</p> <p>Draw and describe a locus</p> <p>Identify isometries</p> <p>Find reflection images of figures</p> <p>Describe translations using vectors</p> <p>Find translation images using matrix and vector sums</p> <p>Draw and identify rotation images of figures</p> <p>Use a composition of reflections</p> <p>Identify glide reflections</p> <p>Identify the type of symmetry in a figure</p> <p>Identify transformations in tessellations and figures that will tessellate</p> <p>Identify symmetries of tessellations</p> <p>Locate dilation images of figures</p> <p>Determine the final coordinates of a point after a series of transformations. (1.3.4)</p> <p>Construct one-dimensional, two-dimensional, and three-dimensional geometric figures using a variety of tools and technologies (e.g., angle bisectors, perpendicular bisectors, triangles given specific characteristics). (1.3.2)</p> <p>Recognize the mathematical contribution of a person or culture (e.g., create a report or presentation that highlights a mathematical contribution related</p>			
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	<p>to current mathematical study). Describe how changes in the dimensions of objects affect perimeter, area, and volume in real-world situations (e.g., how does the change in the diameter of an oil drum affect the area and volume). (1.2.1) Select a career and research the mathematics necessary to get the job and the mathematics used in the job.</p>			
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Eleventh Grade ADVANCED ALGEBRA & TRIGONOMETRY

Eleventh Grade	Introduced/Practiced During Year	Delivery Methods	Year-end Proficiencies	State GLEs
Number Sense	Graph and order real numbers Identify and use properties of real numbers Write and interpret direct variation equations Identify and classify matrices and their elements Find common and binomial factors of quadratic expressions Identify complex numbers Add, subtract, and multiply complex numbers Count permutations Count combinations Simplify nth roots Multiply radical expressions Divide radical expressions Add and subtract radical expressions Multiply and divide binomial radical expressions Simplify expressions with rational exponents Identify the role of constants in $y = ab^{cx}$ Use e as a base Write and evaluate logarithmic expressions Use the properties of logarithms Identify properties of rational functions Simplify rational expressions Multiply and divide rational expressions Add and subtract rational expressions	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides	Graph and order real numbers Identify and use properties of real numbers Write and interpret direct variation equations Identify and classify matrices and their elements Find common and binomial factors of quadratic expressions Identify complex numbers Add, subtract, and multiply complex numbers Count permutations Count combinations Simplify nth roots Multiply radical expressions Divide radical expressions Add and subtract radical expressions Multiply and divide binomial radical expressions Simplify expressions with rational exponents Identify the role of constants in $y = ab^{cx}$ Use e as a base Write and evaluate logarithmic expressions Use the properties of logarithms Identify properties of rational functions Simplify rational expressions Multiply and divide rational expressions Add and subtract rational expressions	NONE AT THIS TIME
Measurement	Find the area under a curve	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides	Find the area under a curve	
Geometric Sense	Graph relations Graph linear equations Graph absolute value functions Graph linear inequalities Graph absolute value inequalities Graph points in three dimensions Graph equations in three dimensions Represent translations and dilations with matrices Represent reflections and rotations	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral	Graph relations Graph linear equations Graph absolute value functions Graph linear inequalities Graph absolute value inequalities Graph points in three dimensions Graph equations in three dimensions Represent translations and dilations with matrices Represent reflections and rotations	

	<p>with matrices</p> <p>Graph quadratic functions</p> <p>Graph complex numbers</p> <p>Graph inverse variations</p> <p>Graph translations of inverse variations</p> <p>Graph rational functions</p> <p>Graph conic sections</p> <p>Graph parabolas</p> <p>Find the center and radius of a circle and use it to graph the circle</p> <p>Write and graph the equation of a circle</p> <p>Graph an ellipse</p> <p>Graph hyperbolas</p> <p>Graph sine curves</p> <p>Graph cosine curves</p> <p>Graph the tangent function</p> <p>Graph translations of trigonometric functions</p> <p>Graph reciprocal trigonometric functions</p> <p>Find the lengths of sides in a right triangle (using trigonometry)</p> <p>Find the measures of angles in a right triangle (using trigonometry)</p>	<p>explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>with matrices</p> <p>Graph quadratic functions</p> <p>Graph complex numbers</p> <p>Graph inverse variations</p> <p>Graph translations of inverse variations</p> <p>Graph rational functions</p> <p>Graph conic sections</p> <p>Graph parabolas</p> <p>Find the center and radius of a circle and use it to graph the circle</p> <p>Write and graph the equation of a circle</p> <p>Graph an ellipse</p> <p>Graph hyperbolas</p> <p>Graph sine curves</p> <p>Graph cosine curves</p> <p>Graph the tangent function</p> <p>Graph translations of trigonometric functions</p> <p>Graph reciprocal trigonometric functions</p> <p>Find the lengths of sides in a right triangle (using trigonometry)</p> <p>Find the measures of angles in a right triangle (using trigonometry)</p>	
Probability and Statistics	<p>Find experimental probabilities</p> <p>Find theoretical probabilities</p> <p>Make predictions from linear models</p> <p>Organize data into matrices</p> <p>Model data with quadratic functions</p> <p>Count permutations</p> <p>Count combinations</p> <p>Find the probabilities of events A and B</p> <p>Find the probabilities of events A or B</p> <p>Make a probability distribution</p> <p>Use a probability distribution in conducting a simulation</p> <p>Find conditional probabilities</p> <p>Use formulas and tree diagrams</p> <p>Calculate measures of central tendency</p> <p>Draw and interpret box-and-whisker plots</p> <p>Find the standard deviation in real-world situations</p> <p>Find sample proportions</p> <p>Find the margin of error</p> <p>Find binomial probabilities</p> <p>Use binomial distributions</p> <p>Use a normal distribution</p> <p>Use the standard normal curve</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Find experimental probabilities</p> <p>Find theoretical probabilities</p> <p>Make predictions from linear models</p> <p>Organize data into matrices</p> <p>Model data with quadratic functions</p> <p>Count permutations</p> <p>Count combinations</p> <p>Find the probabilities of events A and B</p> <p>Find the probabilities of events A or B</p> <p>Make a probability distribution</p> <p>Use a probability distribution in conducting a simulation</p> <p>Find conditional probabilities</p> <p>Use formulas and tree diagrams</p> <p>Calculate measures of central tendency</p> <p>Draw and interpret box-and-whisker plots</p> <p>Find the standard deviation in real-world situations</p> <p>Find sample proportions</p> <p>Find the margin of error</p> <p>Find binomial probabilities</p> <p>Use binomial distributions</p> <p>Use a normal distribution</p> <p>Use the standard normal curve</p>	
Algebraic Sense	<p>Evaluate algebraic expressions</p> <p>Simplify algebraic expressions</p> <p>Solve equations</p> <p>Solve problems by writing equations</p> <p>Solve and graph inequalities</p> <p>Solve and write compound inequalities</p> <p>Solve absolute value equations</p> <p>Solve absolute value inequalities</p> <p>Identify functions</p> <p>Write equations of lines</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p>	<p>Evaluate algebraic expressions</p> <p>Simplify algebraic expressions</p> <p>Solve equations</p> <p>Solve problems by writing equations</p> <p>Solve and graph inequalities</p> <p>Solve and write compound inequalities</p> <p>Solve absolute value equations</p> <p>Solve absolute value inequalities</p> <p>Identify functions</p> <p>Write equations of lines</p>	

	<p>Write linear equations that model real-world data</p> <p>Analyze vertical translations</p> <p>Analyze horizontal translations</p> <p>Solve a system by graphing</p> <p>Solve a system by substitution</p> <p>Solve a system by elimination</p> <p>Solve a system of linear inequalities</p> <p>Find maximum and minimum values</p> <p>Solve problems with linear programming</p> <p>Solve systems in three variables by substitution</p> <p>Solve systems in three variables by elimination</p> <p>Organize data into matrices</p> <p>Add and subtract matrices</p> <p>Solve some matrix equations</p> <p>Multiply a matrix by a scalar</p> <p>Multiply two matrices</p> <p>Evaluate determinants of 2×2 matrices and find inverse matrices</p> <p>Use inverse matrices in solving matrix equations</p> <p>Evaluate determinants in 3×3 matrices</p> <p>Solve systems of equations using inverse matrices</p> <p>Solve a system of equations using Cramer's Rule</p> <p>Solve a system of equations using augmented matrices</p> <p>Identify quadratic functions and graphs</p> <p>Model data with quadratic functions</p> <p>Find maximum and minimum values of quadratic functions</p> <p>Use the vertex form of a quadratic function</p> <p>Factor special quadratic expressions</p> <p>Solve quadratic equations by factoring and finding square roots</p> <p>Solve quadratic equations by graphing</p> <p>Solve equations by completing the square</p> <p>Rewrite functions in vertex form by completing the square</p> <p>Solve quadratic equations by using the Quadratic Formula</p> <p>Determine types of solutions by using the discriminant</p> <p>Classify polynomials</p> <p>Model data using polynomial functions</p> <p>Analyze the factored form of a polynomial</p> <p>Write a polynomial function from its zeros</p> <p>Divide polynomials using long division</p> <p>Divide polynomials using synthetic division</p> <p>Solve polynomial equations by graphing</p> <p>Solve polynomial equations by factoring</p>	<p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Write linear equations that model real-world data</p> <p>Analyze vertical translations</p> <p>Analyze horizontal translations</p> <p>Solve a system by graphing</p> <p>Solve a system by substitution</p> <p>Solve a system by elimination</p> <p>Solve a system of linear inequalities</p> <p>Find maximum and minimum values</p> <p>Solve problems with linear programming</p> <p>Solve systems in three variables by substitution</p> <p>Solve systems in three variables by elimination</p> <p>Organize data into matrices</p> <p>Add and subtract matrices</p> <p>Solve some matrix equations</p> <p>Multiply a matrix by a scalar</p> <p>Multiply two matrices</p> <p>Evaluate determinants of 2×2 matrices and find inverse matrices</p> <p>Use inverse matrices in solving matrix equations</p> <p>Evaluate determinants in 3×3 matrices</p> <p>Solve systems of equations using inverse matrices</p> <p>Solve a system of equations using Cramer's Rule</p> <p>Solve a system of equations using augmented matrices</p> <p>Identify quadratic functions and graphs</p> <p>Model data with quadratic functions</p> <p>Find maximum and minimum values of quadratic functions</p> <p>Use the vertex form of a quadratic function</p> <p>Factor special quadratic expressions</p> <p>Solve quadratic equations by factoring and finding square roots</p> <p>Solve quadratic equations by graphing</p> <p>Solve equations by completing the square</p> <p>Rewrite functions in vertex form by completing the square</p> <p>Solve quadratic equations by using the Quadratic Formula</p> <p>Determine types of solutions by using the discriminant</p> <p>Classify polynomials</p> <p>Model data using polynomial functions</p> <p>Analyze the factored form of a polynomial</p> <p>Write a polynomial function from its zeros</p> <p>Divide polynomials using long division</p> <p>Divide polynomials using synthetic division</p> <p>Solve polynomial equations by graphing</p> <p>Solve polynomial equations by factoring</p>	
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	<p>Solve equations using the Rational Root Theorem Use the Irrational Root Theorem and the Imaginary Root Theorem Use the Fundamental Theorem of Algebra Solve polynomial equations with complex zeros Count permutations Count combinations Use Pascal's Triangle Use the Binomial Theorem Simplify nth roots Multiply radical expressions Divide radical expressions Add and subtract radical expressions Multiply and divide binomial radical expressions Simplify expressions with rational exponents Solve radical equations Add, subtract, multiply and divide functions Find the composite of two functions Find the inverse of a relation or function Graph radical functions Model exponential growth Model exponential decay Graph logarithmic functions Solve exponential equations Solve logarithmic equations Evaluate natural logarithmic expressions Solve equations using natural logarithms Use inverse variation Use combined variation Simplify complex fractions Solve rational equations Use rational equations in solving problems Identify conic sections Write the equation of a parabola Write and graph the equation of a circle Find the center and radius of a circle and use it to graph the circle Write the equation of an ellipse Find the foci of an ellipse Find and use the foci of a hyperbola Write the equation of a translated conic section Identify the equation of a translated conic section Identify mathematical patterns Use a formula for finding the nth term of a sequence Identify and generate arithmetic sequences Identify and generate geometric sequences Write and evaluate arithmetic series Evaluate a given number of terms of a series Evaluate an infinite geometric series Evaluate a finite geometric series</p>		<p>Solve equations using the Rational Root Theorem Use the Irrational Root Theorem and the Imaginary Root Theorem Use the Fundamental Theorem of Algebra Solve polynomial equations with complex zeros Count permutations Count combinations Use Pascal's Triangle Use the Binomial Theorem Simplify nth roots Multiply radical expressions Divide radical expressions Add and subtract radical expressions Multiply and divide binomial radical expressions Simplify expressions with rational exponents Solve radical equations Add, subtract, multiply and divide functions Find the composite of two functions Find the inverse of a relation or function Graph radical functions Model exponential growth Model exponential decay Graph logarithmic functions Solve exponential equations Solve logarithmic equations Evaluate natural logarithmic expressions Solve equations using natural logarithms Use inverse variation Use combined variation Simplify complex fractions Solve rational equations Use rational equations in solving problems Identify conic sections Write the equation of a parabola Write and graph the equation of a circle Find the center and radius of a circle and use it to graph the circle Write the equation of an ellipse Find the foci of an ellipse Find and use the foci of a hyperbola Write the equation of a translated conic section Identify the equation of a translated conic section Identify mathematical patterns Use a formula for finding the nth term of a sequence Identify and generate arithmetic sequences Identify and generate geometric sequences Write and evaluate arithmetic series Evaluate a given number of terms of a series Evaluate an infinite geometric series Evaluate a finite geometric series</p>	
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	<p>Find the area under a curve</p> <p>Identify cycles and periods of periodic functions</p> <p>Find the amplitude of periodic functions</p> <p>Work with angles in standard position</p> <p>Find coordinates of points on the unit circle</p> <p>Use radian measure for angles</p> <p>Find the length of an arc of a circle</p> <p>Identify properties of the sine function</p> <p>Write cosine functions</p> <p>Solve trigonometric equations</p> <p>Write equations of translations</p> <p>Evaluate reciprocal trigonometric functions</p> <p>Verify trigonometric identities</p> <p>Evaluate inverses of trigonometric functions</p> <p>Find the lengths of sides in a right triangle (using trigonometry)</p> <p>Find the measures of angles in a right triangle (using trigonometry)</p> <p>Find the area of a triangle and use the Law of Sines</p> <p>Use the Law of Cosines to find the area of any triangle</p> <p>Verify angle identities</p> <p>Verify sum and difference identities</p> <p>Verify double-angle identities</p> <p>Verify half-angle identities</p>		<p>Find the area under a curve</p> <p>Identify cycles and periods of periodic functions</p> <p>Find the amplitude of periodic functions</p> <p>Work with angles in standard position</p> <p>Find coordinates of points on the unit circle</p> <p>Use radian measure for angles</p> <p>Find the length of an arc of a circle</p> <p>Identify properties of the sine function</p> <p>Write cosine functions</p> <p>Solve trigonometric equations</p> <p>Write equations of translations</p> <p>Evaluate reciprocal trigonometric functions</p> <p>Verify trigonometric identities</p> <p>Evaluate inverses of trigonometric functions</p> <p>Find the lengths of sides in a right triangle (using trigonometry)</p> <p>Find the measures of angles in a right triangle (using trigonometry)</p> <p>Find the area of a triangle and use the Law of Sines</p> <p>Use the Law of Cosines to find the area of any triangle</p> <p>Verify angle identities</p> <p>Verify sum and difference identities</p> <p>Verify double-angle identities</p> <p>Verify half-angle identities</p>	
Problem Solving	<p>Write linear equations that model real-world data</p> <p>Make predictions from linear models</p> <p>Solve a system by substitution</p> <p>Solve a system by elimination</p> <p>Find maximum and minimum values</p> <p>Solve problems with linear programming</p> <p>Solve systems in three variables by elimination</p> <p>Solve systems in three variables by substitution</p> <p>Evaluate determinants of 3×3 matrices</p> <p>Use inverse matrices in solving matrix equations</p> <p>Graph quadratic functions</p> <p>Find maximum and minimum values of quadratic functions</p> <p>Solve quadratic equations by factoring and by finding square roots</p> <p>Solve quadratic equations by graphing</p> <p>Solve equations by completing the square</p> <p>Rewrite functions in vertex form by completing the square</p> <p>Solve quadratic equations by using the Quadratic Formula</p> <p>Determine types of solutions by using the discriminant</p> <p>Analyze the factored form of a polynomial</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Write linear equations that model real-world data</p> <p>Make predictions from linear models</p> <p>Solve a system by substitution</p> <p>Solve a system by elimination</p> <p>Find maximum and minimum values</p> <p>Solve problems with linear programming</p> <p>Solve systems in three variables by elimination</p> <p>Solve systems in three variables by substitution</p> <p>Evaluate determinants of 3×3 matrices</p> <p>Use inverse matrices in solving matrix equations</p> <p>Graph quadratic functions</p> <p>Find maximum and minimum values of quadratic functions</p> <p>Solve quadratic equations by factoring and by finding square roots</p> <p>Solve quadratic equations by graphing</p> <p>Solve equations by completing the square</p> <p>Rewrite functions in vertex form by completing the square</p> <p>Solve quadratic equations by using the Quadratic Formula</p> <p>Determine types of solutions by using the discriminant</p> <p>Analyze the factored form of a polynomial</p>	

	<p>Write a polynomial function from its zeros</p> <p>Solve polynomial equations by graphing</p> <p>Solve polynomial equations by factoring</p> <p>Count permutations</p> <p>Count combinations</p> <p>Solve radical equations</p> <p>Add, subtract, multiply, and divide functions</p> <p>Find the composite of two functions</p> <p>Solve exponential equations</p> <p>Solve logarithmic equations</p> <p>Simplify rational expressions</p> <p>Multiply and divide rational expressions</p> <p>Add and subtract rational expressions</p> <p>Simplify complex fractions</p> <p>Solve rational equations</p> <p>Use rational equations in solving problems</p> <p>Identify types of events</p> <p>Find probabilities of multiple events</p> <p>Write the equation of a parabola</p> <p>Graph parabolas</p> <p>Write and graph the equation of a circle</p> <p>Find the center and radius of a circle and use it to graph the circle</p> <p>Write the equation of an ellipse</p> <p>Find the foci of an ellipse</p> <p>Graph hyperbolas</p> <p>Find and use the foci of a hyperbola</p> <p>Write the equation of a translated conic section</p> <p>Identify the equation of a translated conic section</p> <p>Find sample proportions</p> <p>Find the margin of error</p> <p>Find binomial probabilities</p> <p>Use binomial distributions</p> <p>Use a normal distribution</p> <p>Use the standard normal curve</p>		<p>Write a polynomial function from its zeros</p> <p>Solve polynomial equations by graphing</p> <p>Solve polynomial equations by factoring</p> <p>Count permutations</p> <p>Count combinations</p> <p>Solve radical equations</p> <p>Add, subtract, multiply, and divide functions</p> <p>Find the composite of two functions</p> <p>Solve exponential equations</p> <p>Solve logarithmic equations</p> <p>Simplify rational expressions</p> <p>Multiply and divide rational expressions</p> <p>Add and subtract rational expressions</p> <p>Simplify complex fractions</p> <p>Solve rational equations</p> <p>Use rational equations in solving problems</p> <p>Identify types of events</p> <p>Find probabilities of multiple events</p> <p>Write the equation of a parabola</p> <p>Graph parabolas</p> <p>Write and graph the equation of a circle</p> <p>Find the center and radius of a circle and use it to graph the circle</p> <p>Write the equation of an ellipse</p> <p>Find the foci of an ellipse</p> <p>Graph hyperbolas</p> <p>Find and use the foci of a hyperbola</p> <p>Write the equation of a translated conic section</p> <p>Identify the equation of a translated conic section</p> <p>Find sample proportions</p> <p>Find the margin of error</p> <p>Find binomial probabilities</p> <p>Use binomial distributions</p> <p>Use a normal distribution</p> <p>Use the standard normal curve</p>	
Reasoning	<p>Solve absolute value equations</p> <p>Solve absolute value inequalities</p> <p>Graph linear equations</p> <p>Write equations of lines</p> <p>Represent translations and dilations with matrices</p> <p>Represent reflections and rotations with matrices</p> <p>Evaluate determinants of 2×2 matrices and find inverse matrices</p> <p>Use inverse matrices in solving matrix equations</p> <p>Evaluate determinants of 3×3 matrices</p> <p>Solve equations by completing the square</p> <p>Rewrite functions in vertex form by completing the square</p> <p>Solve quadratic equations by using the Quadratic Formula</p> <p>Determine types of solutions by</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Solve absolute value equations</p> <p>Solve absolute value inequalities</p> <p>Graph linear equations</p> <p>Write equations of lines</p> <p>Represent translations and dilations with matrices</p> <p>Represent reflections and rotations with matrices</p> <p>Evaluate determinants of 2×2 matrices and find inverse matrices</p> <p>Use inverse matrices in solving matrix equations</p> <p>Evaluate determinants of 3×3 matrices</p> <p>Solve equations by completing the square</p> <p>Rewrite functions in vertex form by completing the square</p> <p>Solve quadratic equations by using the Quadratic Formula</p> <p>Determine types of solutions by</p>	

	<p>using the discriminant Solve equations using the Rational Root Theorem Use the Irrational Root Theorem and the Imaginary Root Theorem Use the Fundamental Theorem of Algebra Solve polynomial equations with complex zeros Use Pascal's Triangle Use the Binomial Theorem Simplify nth roots Add and subtract radical expressions Multiply and divide binomial radical expressions Find the inverse of a relation or function Model exponential growth Model exponential decay Write and evaluate logarithmic expressions Graph logarithmic functions Find the area under a curve Graph and write cosine functions Solve trigonometric equations Graph the tangent function Graph translations of trigonometric functions Write equations of translations Evaluate reciprocal trigonometric functions Graph reciprocal trigonometric functions Evaluate inverses of trigonometric functions Find the area of any triangle and use the Law of Sines Use the Law of Cosines to find the area of any triangle Verify angle identities Verify sum and difference identities Verify double-angle identities Verify half-angle identities</p>		<p>using the discriminant Solve equations using the Rational Root Theorem Use the Irrational Root Theorem and the Imaginary Root Theorem Use the Fundamental Theorem of Algebra Solve polynomial equations with complex zeros Use Pascal's Triangle Use the Binomial Theorem Simplify nth roots Add and subtract radical expressions Multiply and divide binomial radical expressions Find the inverse of a relation or function Model exponential growth Model exponential decay Write and evaluate logarithmic expressions Graph logarithmic functions Find the area under a curve Graph and write cosine functions Solve trigonometric equations Graph the tangent function Graph translations of trigonometric functions Write equations of translations Evaluate reciprocal trigonometric functions Graph reciprocal trigonometric functions Evaluate inverses of trigonometric functions Find the area of any triangle and use the Law of Sines Use the Law of Cosines to find the area of any triangle Verify angle identities Verify sum and difference identities Verify double-angle identities Verify half-angle identities</p>	
Communication	<p>Graph and order real numbers Identify and use properties of real numbers Graph relations Identify functions Write and interpret direct variation equations Find maximum and minimum values Solve problems with linear programming Solve a system of equations using Cramer's Rule Solve a system of equations using augmented matrices Use the Fundamental Theorem of Algebra Solve polynomial equations with complex zeros Identify and generate arithmetic sequences Identify and generate geometric sequences</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Graph and order real numbers Identify and use properties of real numbers Graph relations Identify functions Write and interpret direct variation equations Find maximum and minimum values Solve problems with linear programming Solve a system of equations using Cramer's Rule Solve a system of equations using augmented matrices Use the Fundamental Theorem of Algebra Solve polynomial equations with complex zeros Identify and generate arithmetic sequences Identify and generate geometric sequences</p>	

	<p>Find binomial probabilities Use binomial distributions Use a normal distribution Use the standard normal curve Work with angles in standard position Find coordinates of points on the unit circle Graph the tangent function Graph translations of trigonometric functions Write equations of translations Evaluate reciprocal trigonometric functions Graph reciprocal trigonometric functions Find lengths of sides in a right triangle Find measures of angles in a right triangle Verify angle identities Verify sum and difference identities Verify double-angle identities Verify half-angle identities</p>		<p>Find binomial probabilities Use binomial distributions Use a normal distribution Use the standard normal curve Work with angles in standard position Find coordinates of points on the unit circle Graph the tangent function Graph translations of trigonometric functions Write equations of translations Evaluate reciprocal trigonometric functions Graph reciprocal trigonometric functions Find lengths of sides in a right triangle Find measures of angles in a right triangle Verify angle identities Verify sum and difference identities Verify double-angle identities Verify half-angle identities</p>	
Connections	<p>Solve equations Solve problems by writing equations Write and interpret direct variation equations Write linear equations that model real-world data Make predictions from linear models Solve a system by graphing Solve a system by substitution Solve a system by elimination Solve systems of linear inequalities Solve systems in three variables by elimination Solve systems in three variables by substitution Identify and classify matrices and their elements Organize data into matrices Add and subtract matrices Solve some matrix equations Multiply a matrix by a scalar Multiply two matrices Represent translations and dilations with matrices Represent reflections and rotations with matrices Evaluate determinants of 2×2 matrices and find inverse matrices Use inverse matrices in solving matrix equations Evaluate determinants of 3×3 matrices Solve a system of equations using Cramer's Rule Solve a system of equations using augmented matrices Solve quadratic equations by factoring and by finding square roots Solve quadratic equations by graphing Analyze the factored form of a polynomial</p>	<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>	<p>Solve equations Solve problems by writing equations Write and interpret direct variation equations Write linear equations that model real-world data Make predictions from linear models Solve a system by graphing Solve a system by substitution Solve a system by elimination Solve systems of linear inequalities Solve systems in three variables by elimination Solve systems in three variables by substitution Identify and classify matrices and their elements Organize data into matrices Add and subtract matrices Solve some matrix equations Multiply a matrix by a scalar Multiply two matrices Represent translations and dilations with matrices Represent reflections and rotations with matrices Evaluate determinants of 2×2 matrices and find inverse matrices Use inverse matrices in solving matrix equations Evaluate determinants of 3×3 matrices Solve a system of equations using Cramer's Rule Solve a system of equations using augmented matrices Solve quadratic equations by factoring and by finding square roots Solve quadratic equations by graphing Analyze the factored form of a polynomial</p>	

	<p>Write a polynomial function from its zeros Divide polynomials using long division Divide polynomials using synthetic division Solve polynomial equations by graphing Solve polynomial equations by factoring Use Pascal's Triangle Use the Binomial Theorem Graph radical functions Use the properties of logarithms Evaluate natural logarithmic expressions Solve equations using natural logarithms Find binomial probabilities Use binomial distributions Use a normal distribution Use the standard normal curve Verify trigonometric identities</p>		<p>Write a polynomial function from its zeros Divide polynomials using long division Divide polynomials using synthetic division Solve polynomial equations by graphing Solve polynomial equations by factoring Use Pascal's Triangle Use the Binomial Theorem Graph radical functions Use the properties of logarithms Evaluate natural logarithmic expressions Solve equations using natural logarithms Find binomial probabilities Use binomial distributions Use a normal distribution Use the standard normal curve Verify trigonometric identities</p>	
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Twelfth Grade PRE-CALCULUS

Twelfth Grade: College Algebra	Introduced/Practiced During Year	Delivery Methods	Year-end Proficiencies	State GLEs
Number Sense	Classify real numbers Convert between decimals and fractions Convert between intervals and inequalities Write inequalities Work with exponents and scientific notation Add, subtract, multiply, and divide complex numbers Represent complex numbers in trigonometric form Perform operations on complex numbers in trigonometric form	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides	Classify real numbers Convert between decimals and fractions Convert between intervals and inequalities Write inequalities Work with exponents and scientific notation Add, subtract, multiply, and divide complex numbers Represent complex numbers in trigonometric form Perform operations on complex numbers in trigonometric form	NONE AT THIS TIME
Measurement	Convert between radians and degrees Find arc lengths Convert arc lengths to nautical miles Use the Law of Cosines to determine the area of a triangle in terms of the measures of its sides and angles	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides	Convert between radians and degrees Find arc lengths Convert arc lengths to nautical miles Use the Law of Cosines to determine the area of a triangle in terms of the measures of its sides and angles	
Geometric Sense	Graph points in a Cartesian plane Find distances on a number line Find midpoint of a segment on a number line Find distances in a coordinate plane Find midpoint of a segment in a coordinate plane Find the slope of a line Represent functions graphically Recognize graphs of 12 basic functions Represent translations, reflections, stretches, and shrinks of functions graphically Represent translations, reflections, stretches, and shrinks of parametric relations graphically Graph linear functions by using transformations Graph quadratic functions by using transformations Graph polynomial functions using a grapher Describe graphs of rational functions Solve inequalities involving polynomials and rational functions by using graphical techniques Identify and graph exponential and logistic functions	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides	Graph points in a Cartesian plane Find distances on a number line Find midpoint of a segment on a number line Find distances in a coordinate plane Find midpoint of a segment in a coordinate plane Find the slope of a line Represent functions graphically Recognize graphs of 12 basic functions Represent translations, reflections, stretches, and shrinks of functions graphically Graph linear functions by using transformations Graph quadratic functions by using transformations Graph polynomial functions using a grapher Describe graphs of rational functions Solve inequalities involving polynomials and rational functions by using graphical techniques Identify and graph exponential functions Graph common and natural logarithms Apply the properties of logarithms to	

	<p>Graph common and natural logarithms</p> <p>Apply the properties of logarithms to graph functions</p> <p>Generate the graphs of the sine and cosine functions</p> <p>Explore various transformations of the graphs of the sine and cosine functions</p> <p>Generate the graphs of the tangent, cotangent, secant, and cosecant</p> <p>Explore various transformations of the graphs of the tangent, cotangent, secant, and cosecant functions</p> <p>Graph sums, differences, and other combinations of trigonometric functions</p> <p>Graph sums, differences, and other combinations of algebraic functions</p> <p>Graph curves parametrically</p> <p>Convert points and equations from polar to rectangular coordinates and vice versa</p> <p>Graph polar equations</p> <p>Graph quadratic equations in two variables with translation or rotation of axes</p> <p>Write the distance and midpoint formulas in three dimensions</p>		<p>graph functions</p> <p>Generate the graphs of the sine and cosine functions</p> <p>Explore various transformations of the graphs of the sine and cosine functions</p> <p>Generate the graphs of the tangent, cotangent, secant, and cosecant</p> <p>Explore various transformations of the graphs of the tangent, cotangent, secant, and cosecant functions</p> <p>Graph sums, differences, and other combinations of trigonometric functions</p> <p>Graph sums, differences, and other combinations of algebraic functions</p> <p>Graph curves parametrically</p> <p>Convert points and equations from polar to rectangular coordinates and vice versa</p> <p>Graph polar equations</p> <p>Graph quadratic equations in two variables with translation or rotation of axes</p> <p>Write the distance and midpoint formulas in three dimensions</p>	
Probability and Statistics	<p>Use the multiplication principle of counting to count the number of ways a task can be done</p> <p>Use permutations or combinations to count the number of ways a task can be done</p> <p>Identify a sample space</p> <p>Calculate probabilities and conditional probabilities in sample spaces with equally likely or unequally likely outcomes</p> <p>Distinguish between categorical and quantitative variables</p> <p>Use various kinds of graphs to display data</p> <p>Use measures of center, the five-number summary, a boxplot, standard deviation, and normal distribution to describe quantitative data</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Use the multiplication principle of counting to count the number of ways a task can be done</p> <p>Use permutations or combinations to count the number of ways a task can be done</p> <p>Identify a sample space</p> <p>Calculate probabilities and conditional probabilities in sample spaces with equally likely or unequally likely outcomes</p> <p>Distinguish between categorical and quantitative variables</p> <p>Use various kinds of graphs to display data</p> <p>Use measures of center, the five-number summary, a boxplot, standard deviation, and normal distribution to describe quantitative data</p>	
Algebraic Sense	<p>Apply the commutative, associative, identity, inverse, and distributive properties</p> <p>Apply the properties of additive inverse</p> <p>Write standard-form equations of circles</p> <p>Solve linear equations in one variable</p> <p>Solve inequalities in one variable</p> <p>Find the slope-intercept equation of a line</p> <p>Find the point-slope equation for a line</p> <p>Write the standard equation for a line</p> <p>Write the equation of a line parallel to a given line</p> <p>Write the equation of a line</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>	<p>Apply the commutative, associative, identity, inverse, and distributive properties</p> <p>Apply the properties of additive inverse</p> <p>Write standard-form equations of circles</p> <p>Solve linear equations in one variable</p> <p>Solve inequalities in one variable</p> <p>Find the slope-intercept equation of a line</p> <p>Find the point-slope equation for a line</p> <p>Write the standard equation for a line</p> <p>Write the equation of a line parallel to a given line</p> <p>Write the equation of a line</p>	

	<p>perpendicular to a given line Model real-world situations with linear equations Solve quadratic equations by finding x-intercepts Solve quadratic equations by using square root property Solve quadratic equations by completing the square Solve quadratic equations by using the quadratic formula Approximate solutions to equations graphically Approximate solutions to equations numerically with tables Solve absolute value equations by finding intersections Solve absolute value inequalities Solve quadratic inequalities Solve inequalities involving expressions with fractions Approximate solutions to inequalities Apply techniques for solving equations and inequalities to real-world situations Use a numerical model to solve problems Use an algebraic model to solve problems Use a graphical model to solve problems Translate from one model to another Represent functions numerically Represent functions algebraically Represent functions graphically Determine the domain and range of a function Analyze function characteristics, including extreme values, symmetry, asymptotes, and end behavior Determine domains of functions related to the 12 basic functions Combine the 12 basic functions in various ways to create new functions Build new functions from old functions by adding, subtracting, multiplying, dividing, and composing functions Build new functions from old functions by computing inverses of functions Build new functions from old functions by defining functions parametrically Represent translations, reflections, stretches, and shrinks of functions algebraically Represent translations, reflections, stretches, and shrinks of parametric relations algebraically Identify appropriate basic functions with which to model real-world problems Produce specific functions to model data, formulas, graphs, and verbal descriptions Use graphs of linear and quadratic</p>		<p>perpendicular to a given line Model real-world situations with linear equations Solve quadratic equations by finding x-intercepts Solve quadratic equations by using square root property Solve quadratic equations by completing the square Solve quadratic equations by using the quadratic formula Approximate solutions to equations graphically Approximate solutions to equations numerically with tables Solve absolute value equations by finding intersections Solve absolute value inequalities Solve quadratic inequalities Solve inequalities involving expressions with fractions Approximate solutions to inequalities Apply techniques for solving equations and inequalities to real-world situations Use a numerical model to solve problems Use an algebraic model to solve problems Use a graphical model to solve problems Translate from one model to another Represent functions numerically Represent functions algebraically Represent functions graphically Determine the domain and range of a function Analyze function characteristics, including extreme values, symmetry, asymptotes, and end behavior Determine domains of functions related to the 12 basic functions Combine the 12 basic functions in various ways to create new functions Build new functions from old functions by adding, subtracting, multiplying, dividing, and composing functions Build new functions from old functions by computing inverses of functions Build new functions from old functions by defining functions parametrically Represent translations, reflections, stretches, and shrinks of functions algebraically Represent translations, reflections, stretches, and shrinks of parametric relations algebraically Identify appropriate basic functions with which to model real-world problems Produce specific functions to model data, formulas, graphs, and verbal descriptions Use graphs of linear and quadratic</p>	
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	<p>functions to model application problems</p> <p>Sketch monomial power functions in the form $f(x) = kx^a$ (where k and a are rational numbers)</p> <p>Graph polynomial functions using an algebraic method</p> <p>Predict end behavior of polynomial functions</p> <p>Find real zeros of polynomial functions using a grapher or an algebraic method</p> <p>Divide polynomials using long division</p> <p>Divide polynomials using synthetic division</p> <p>Apply the Remainder Theorem</p> <p>Apply the Factor Theorem</p> <p>Apply the Rational Zeros Theorem</p> <p>Find upper and lower bounds for zeros of polynomials</p> <p>Find complex zeros of quadratic functions</p> <p>Factor polynomials with real coefficients</p> <p>Identify horizontal and vertical asymptotes for rational functions</p> <p>Predict end behavior for rational functions in which the degree of the numerator is less than or greater than the degree of the denominator</p> <p>Solve equations involving fractions using algebraic techniques</p> <p>Identify extraneous roots of equations involving fractions</p> <p>Solve inequalities involving polynomials and rational functions by using algebraic techniques</p> <p>Evaluate exponential expressions</p> <p>Use exponential growth, decay, and regression to model real-life problems</p> <p>Convert equations between logarithmic and exponential form</p> <p>Evaluate common and natural logarithms</p> <p>Apply the properties of logarithms to evaluate expressions</p> <p>Apply the properties of logarithms to graph functions</p> <p>Re-express data when working with properties of logarithms</p> <p>Apply the properties of logarithms to solve exponential and logarithmic equations algebraically</p> <p>Solve application problems using exponential and logarithmic operations</p> <p>Use exponential functions to solve business and finance applications related to compound interest and annuities</p> <p>Solve problems using angular speed</p> <p>Define the 6 trigonometric functions using the lengths of sides of a right triangle</p> <p>Solve problems involving the</p>		<p>functions to model application problems</p> <p>Sketch monomial power functions in the form $f(x) = kx^a$ (where k and a are rational numbers)</p> <p>Graph polynomial functions using an algebraic method</p> <p>Predict end behavior of polynomial functions</p> <p>Find real zeros of polynomial functions using a grapher or an algebraic method</p> <p>Divide polynomials using long division</p> <p>Divide polynomials using synthetic division</p> <p>Apply the Remainder Theorem</p> <p>Apply the Factor Theorem</p> <p>Apply the Rational Zeros Theorem</p> <p>Find upper and lower bounds for zeros of polynomials</p> <p>Find complex zeros of quadratic functions</p> <p>Factor polynomials with real coefficients</p> <p>Identify horizontal and vertical asymptotes for rational functions</p> <p>Predict end behavior for rational functions in which the degree of the numerator is less than or greater than the degree of the denominator</p> <p>Solve equations involving fractions using algebraic techniques</p> <p>Identify extraneous roots of equations involving fractions</p> <p>Solve inequalities involving polynomials and rational functions by using algebraic techniques</p> <p>Evaluate exponential expressions</p> <p>Use exponential growth, decay, and regression to model real-life problems</p> <p>Convert equations between logarithmic and exponential form</p> <p>Evaluate common and natural logarithms</p> <p>Apply the properties of logarithms to evaluate expressions</p> <p>Apply the properties of logarithms to graph functions</p> <p>Re-express data when working with properties of logarithms</p> <p>Apply the properties of logarithms to solve exponential and logarithmic equations algebraically</p> <p>Solve application problems using exponential and logarithmic operations</p> <p>Use exponential functions to solve business and finance applications related to compound interest and annuities</p> <p>Solve problems using angular speed</p> <p>Define the 6 trigonometric functions using the lengths of sides of a right triangle</p> <p>Solve problems involving the</p>	
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	<p>trigonometric functions of real numbers</p> <p>Solve problems involving the properties of the sine and cosine as periodic functions</p> <p>Relate the concept of inverse function to trigonometric functions</p> <p>Apply the concepts of trigonometry to solve real-world problems</p> <p>Use the fundamental identities to simplify trigonometric expressions and solve trigonometric equations</p> <p>Decide whether an equation is an identity and prove identities analytically</p> <p>Apply identities for the sine, cosine, and tangent of a difference or sum</p> <p>Apply the double-angle identities, power-reducing identities, and half-angle identities</p> <p>Use computational applications of the Law of Sines to solve a variety of problems</p> <p>Apply the Law of Cosines to solve acute and obtuse triangles</p> <p>Apply the arithmetic of vectors</p> <p>Use vectors to solve real-world problems</p> <p>Calculate dot products</p> <p>Calculate the projection of vectors</p> <p>Define parametric equations</p> <p>Solve application problems using parametric equations</p> <p>Determine the maximum r-value and symmetry for a polar equation graph</p> <p>Solve systems of equations graphically and algebraically</p> <p>Find sums, differences, products, and inverses of matrices</p> <p>Solve systems of linear equations using Gaussian elimination</p> <p>Solve systems of linear equations using the reduced row echelon form of a matrix</p> <p>Solve systems of linear equations using an inverse matrix</p> <p>Find the partial fraction decomposition of rational functions with linear factors or irreducible quadratics in the denominator</p> <p>Solve linear programming problems</p> <p>Solve systems of inequalities using graphical methods</p> <p>Write the equation of a parabola in standard form</p> <p>Use the reflective property of parabolas in applications</p> <p>Write the equation of an ellipse</p> <p>Determine the eccentricity of an ellipse</p> <p>Use the reflective properties of an ellipse in application</p> <p>Write the equation of a hyperbola</p> <p>Determine the eccentricity of a hyperbola</p> <p>Use the reflective properties of a hyperbola in applications</p>		<p>trigonometric functions of real numbers</p> <p>Solve problems involving the properties of the sine and cosine as periodic functions</p> <p>Relate the concept of inverse function to trigonometric functions</p> <p>Apply the concepts of trigonometry to solve real-world problems</p> <p>Use the fundamental identities to simplify trigonometric expressions and solve trigonometric equations</p> <p>Decide whether an equation is an identity and prove identities analytically</p> <p>Apply identities for the sine, cosine, and tangent of a difference or sum</p> <p>Apply the double-angle identities, power-reducing identities, and half-angle identities</p> <p>Use computational applications of the Law of Sines to solve a variety of problems</p> <p>Apply the Law of Cosines to solve acute and obtuse triangles</p> <p>Apply the arithmetic of vectors</p> <p>Use vectors to solve real-world problems</p> <p>Calculate dot products</p> <p>Calculate the projection of vectors</p> <p>Define parametric equations</p> <p>Solve application problems using parametric equations</p> <p>Determine the maximum r-value and symmetry for a polar equation graph</p> <p>Solve systems of equations graphically and algebraically</p> <p>Find sums, differences, products, and inverses of matrices</p> <p>Solve systems of linear equations using Gaussian elimination</p> <p>Solve systems of linear equations using the reduced row echelon form of a matrix</p> <p>Solve systems of linear equations using an inverse matrix</p> <p>Find the partial fraction decomposition of rational functions with linear factors or irreducible quadratics in the denominator</p> <p>Solve linear programming problems</p> <p>Solve systems of inequalities using graphical methods</p> <p>Write the equation of a parabola in standard form</p> <p>Use the reflective property of parabolas in applications</p> <p>Write the equation of an ellipse</p> <p>Determine the eccentricity of an ellipse</p> <p>Use the reflective properties of an ellipse in application</p> <p>Write the equation of a hyperbola</p> <p>Determine the eccentricity of a hyperbola</p> <p>Use the reflective properties of a hyperbola in applications</p>	
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	<p>Learn the relationships between conic sections</p> <p>Find the eccentricity of conic sections</p> <p>Explore conic sections using polar equations</p> <p>Write the equations of spheres, planes, and lines in space</p> <p>Expand a power of a binomial using the binomial theorem</p> <p>Expand a power of a binomial using Pascal's Triangle</p> <p>Find the coefficient of a given term of a binomial expansion</p> <p>Express arithmetic and geometric sequences explicitly and recursively</p> <p>Use sigma notation and basic summation formulas to find the sum of an infinite series or a converging infinite geometric series</p> <p>Use the principle of math induction to prove mathematical generalizations</p> <p>Calculate instantaneous velocities and derivatives using limits</p> <p>Calculate definite integrals using areas</p> <p>Use the properties of limits and evaluate one-sided limits, two-sided limits, and limits involving infinity</p> <p>Estimate derivatives and integrals using numerical techniques</p>		<p>Learn the relationships between conic sections</p> <p>Find the eccentricity of conic sections</p> <p>Explore conic sections using polar equations</p> <p>Write the equations of spheres, planes, and lines in space</p> <p>Expand a power of a binomial using the binomial theorem</p> <p>Expand a power of a binomial using Pascal's Triangle</p> <p>Find the coefficient of a given term of a binomial expansion</p> <p>Express arithmetic and geometric sequences explicitly and recursively</p> <p>Use sigma notation and basic summation formulas to find the sum of an infinite series or a converging infinite geometric series</p> <p>Use the principle of math induction to prove mathematical generalizations</p> <p>Calculate instantaneous velocities and derivatives using limits</p> <p>Calculate definite integrals using areas</p> <p>Use the properties of limits and evaluate one-sided limits, two-sided limits, and limits involving infinity</p> <p>Estimate derivatives and integrals using numerical techniques</p>	
Problem Solving		<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>		
Reasoning	<p>Understand the proof of the Law of Sines</p>	<p>Lecture</p> <p>Modeling</p> <p>Drill and practice</p> <p>Textbook</p> <p>Projects</p> <p>Showing work—write out problems and steps</p> <p>Provide written explanations and oral explanations</p> <p>Extended response questions</p> <p>Warm-up activities</p> <p>Web support—on-line quizzing, study guides</p>		

Communication		Modeling Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities		
Connections		Modeling Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities		

Grade 13 AP CALCULUS

Year 13: College Calculus	Introduced/Practiced During Year	Delivery Methods	Year-end Proficiencies	State GLEs
Number Sense		Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides		NONE AT THIS TIME
Measurement	Use increments to calculate slope Convert between radians and degrees, and find arc length Calculate average and instantaneous speeds Apply directly the definition of slope of a curve in order to calculate slopes Find the average rate of change of a function	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides	Use increments to calculate slope Convert between radians and degrees, and find arc length Calculate average and instantaneous speeds Apply directly the definition of slope of a curve in order to calculate slopes Find the average rate of change of a function	
Geometric Sense	Sketch a graph of a line given specific information Identify relationships between parallel lines, perpendicular lines, and slopes Identify the domain and range of a function using its graph Recognize even and odd functions using graphs Graph curves that are described using parametric equations Determine the graphical representation of a function and its inverse Use parametric equations to graph inverse functions Generate the graphs of the trigonometric functions and explore various transformations upon these graphs Graph f from the graph of f' , graph f' from the graph of f , and graph the derivative of a function given numerically with data Approximate derivatives graphically Graph f using information about f' Construct slope fields using technology Interpret slope fields as	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides	Sketch a graph of a line given specific information Identify relationships between parallel lines, perpendicular lines, and slopes Identify the domain and range of a function using its graph Recognize even and odd functions using graphs Graph curves that are described using parametric equations Determine the graphical representation of a function and its inverse Use parametric equations to graph inverse functions Generate the graphs of the trigonometric functions and explore various transformations upon these graphs Graph f from the graph of f' , graph f' from the graph of f , and graph the derivative of a function given numerically with data Approximate derivatives graphically Graph f using information about f' Construct slope fields using technology Interpret slope fields as	

	visualizations of differential equations		visualizations of differential equations	
Probability and Statistics		Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides		
Algebraic Sense	Write an equation of a line given specific information Use linear regression equations to solve problems Identify the domain and range of a function using its equation Recognize even and odd functions using equations Interpret and find formulas for piecewise defined functions Write and evaluate compositions of two functions Determine the domain, range, and graph of an exponential function Solve problems involving exponential growth and decay Use exponential regression equations to solve problems Find parameterizations of circles, ellipses, line segments, and other curves Identify a one-to-one function Determine the algebraic representation of a function and its inverse Apply the properties of logarithms Use logarithmic regression to solve problems Identify the periodicity and even-odd properties of the trigonometric functions Use the inverse trigonometric functions to solve problems Calculate average and instantaneous speeds Define and calculate limits for function values and apply the properties of limits Use the Sandwich Theorem to find certain limits indirectly Find and verify end behavior models for various functions Calculate limits as x approaches positive or negative infinity Identify vertical and horizontal asymptotes Identify the intervals upon which a given function is continuous and	Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides	Write an equation of a line given specific information Use linear regression equations to solve problems Identify the domain and range of a function using its equation Recognize even and odd functions using equations Interpret and find formulas for piecewise defined functions Write and evaluate compositions of two functions Determine the domain, range, and graph of an exponential function Solve problems involving exponential growth and decay Use exponential regression equations to solve problems Find parameterizations of circles, ellipses, line segments, and other curves Identify a one-to-one function Determine the algebraic representation of a function and its inverse Apply the properties of logarithms Use logarithmic regression to solve problems Identify the periodicity and even-odd properties of the trigonometric functions Use the inverse trigonometric functions to solve problems Calculate average and instantaneous speeds Define and calculate limits for function values and apply the properties of limits Use the Sandwich Theorem to find certain limits indirectly Find and verify end behavior models for various functions Calculate limits as x approaches positive or negative infinity Identify vertical and horizontal asymptotes Identify the intervals upon which a given function is continuous and	

	<p>understand the meaning of a continuous function</p> <p>Remove removable discontinuities by extending or modifying a function</p> <p>Apply the Intermediate Value Theorem and the properties of algebraic combinations and composites of continuous functions</p> <p>Find the equations of the tangent line and normal line to a curve at a given point</p> <p>Calculate slopes and derivatives using the definition of the derivative</p> <p>Find where a function is not differentiable and distinguish between corners, cusps, discontinuities, and vertical tangents</p> <p>Approximate derivatives numerically</p> <p>Use the rules of differentiation to calculate derivatives, including second and higher order derivatives</p> <p>Use derivatives to analyze straight line motion and solve other problems involving rates of change</p> <p>Use the rules for differentiating the six basic trigonometric functions</p> <p>Differentiate composite functions using the Chain Rule</p> <p>Find slopes of parameterized curves</p> <p>Find derivatives using implicit differentiation</p> <p>Find derivatives using the Power Rule for Rational Powers of x</p> <p>Calculate derivatives of functions involving the inverse trigonometric functions</p> <p>Calculate derivatives of exponential and logarithmic functions</p> <p>Apply the Mean Value Theorem</p> <p>Find the intervals on which a function is increasing or decreasing</p> <p>Use the First and Second Derivative Tests to determine the local extreme values of a function</p> <p>Determine the concavity of a function</p> <p>Locate the points of inflection of a function by analyzing the second derivative</p> <p>Solve application problems involving find minimum or maximum values of functions</p> <p>Find linearizations and use Newton's Method to approximate the zeros of a function</p> <p>Estimate the change in a function using differentials</p> <p>Solve related rate problems</p> <p>Approximate the area under the graph of a nonnegative continuous function by using rectangle approximation methods</p> <p>Express the area under a curve as a definite integral and as a limit of Riemann sums</p> <p>Compute the area under a curve using numerical integration</p>		<p>understand the meaning of a continuous function</p> <p>Remove removable discontinuities by extending or modifying a function</p> <p>Apply the Intermediate Value Theorem and the properties of algebraic combinations and composites of continuous functions</p> <p>Find the equations of the tangent line and normal line to a curve at a given point</p> <p>Calculate slopes and derivatives using the definition of the derivative</p> <p>Find where a function is not differentiable and distinguish between corners, cusps, discontinuities, and vertical tangents</p> <p>Approximate derivatives numerically</p> <p>Use the rules of differentiation to calculate derivatives, including second and higher order derivatives</p> <p>Use derivatives to analyze straight line motion and solve other problems involving rates of change</p> <p>Use the rules for differentiating the six basic trigonometric functions</p> <p>Differentiate composite functions using the Chain Rule</p> <p>Find slopes of parameterized curves</p> <p>Find derivatives using implicit differentiation</p> <p>Find derivatives using the Power Rule for Rational Powers of x</p> <p>Calculate derivatives of functions involving the inverse trigonometric functions</p> <p>Calculate derivatives of exponential and logarithmic functions</p> <p>Apply the Mean Value Theorem</p> <p>Find the intervals on which a function is increasing or decreasing</p> <p>Use the First and Second Derivative Tests to determine the local extreme values of a function</p> <p>Determine the concavity of a function</p> <p>Locate the points of inflection of a function by analyzing the second derivative</p> <p>Solve application problems involving find minimum or maximum values of functions</p> <p>Find linearizations and use Newton's Method to approximate the zeros of a function</p> <p>Estimate the change in a function using differentials</p> <p>Solve related rate problems</p> <p>Approximate the area under the graph of a nonnegative continuous function by using rectangle approximation methods</p> <p>Express the area under a curve as a definite integral and as a limit of Riemann sums</p> <p>Compute the area under a curve using numerical integration</p>	
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	<p>procedure</p> <p>Apply rules for definite integrals</p> <p>Find the average value of a function over a closed interval</p> <p>Apply the Fundamental Theorem of Calculus</p> <p>Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus</p> <p>Approximate the definite integral using the Trapezoidal Rule and Simpson's Rule</p> <p>Construct antiderivatives using the Fundamental Theorem of Calculus</p> <p>Find antiderivatives of polynomials, e^{kx}, and selected trigonometric functions of kx, as well as linear combinations of these functions</p> <p>Solve initial value problems of the form $dy/dx = f(x)$, $y_0 = f(x_0)$</p> <p>Compute indefinite and definite integrals by the method of substitution</p> <p>Solve a differential equation of the form $dy/dx = f(x)$, in which the variables are separable</p> <p>Use integration by parts to evaluate indefinite and definite integrals</p> <p>Use tabular integration or the method of solving for the unknown integral in order to evaluate integrals that require repeated use of integration by parts</p> <p>Solve problems involving exponential growth and decay in a variety of applications</p> <p>Solve problems involving exponential or logistic population growth</p> <p>Use Euler's Method and the improved Euler's Method to find approximate solutions to differential equations with initial values</p> <p>Solve problems in which a rate is integrated to find the net change over time in a variety of applications</p> <p>Use integration to calculate areas of regions in a plane</p> <p>Use integration (by slices or shells) to calculate volumes of solids</p> <p>Use integration to calculate surface areas of solids of revolution</p> <p>Use integration to calculate lengths of curves in a plane</p> <p>Adapt knowledge of integral calculus to model problems involving rates of change in a variety of applications, possibly in unfamiliar contexts</p> <p>Find limits of indeterminate forms using l'Hopital's Rule</p> <p>Use little-oh and big-oh notation in determining, investigating, and comparing the rates of growth of functions</p> <p>Use limits to evaluate improper</p>		<p>procedure</p> <p>Apply rules for definite integrals</p> <p>Find the average value of a function over a closed interval</p> <p>Apply the Fundamental Theorem of Calculus</p> <p>Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus</p> <p>Approximate the definite integral using the Trapezoidal Rule and Simpson's Rule</p> <p>Construct antiderivatives using the Fundamental Theorem of Calculus</p> <p>Find antiderivatives of polynomials, e^{kx}, and selected trigonometric functions of kx, as well as linear combinations of these functions</p> <p>Solve initial value problems of the form $dy/dx = f(x)$, $y_0 = f(x_0)$</p> <p>Compute indefinite and definite integrals by the method of substitution</p> <p>Solve a differential equation of the form $dy/dx = f(x)$, in which the variables are separable</p> <p>Use integration by parts to evaluate indefinite and definite integrals</p> <p>Use tabular integration or the method of solving for the unknown integral in order to evaluate integrals that require repeated use of integration by parts</p> <p>Solve problems involving exponential growth and decay in a variety of applications</p> <p>Solve problems involving exponential or logistic population growth</p> <p>Use Euler's Method and the improved Euler's Method to find approximate solutions to differential equations with initial values</p> <p>Solve problems in which a rate is integrated to find the net change over time in a variety of applications</p> <p>Use integration to calculate areas of regions in a plane</p> <p>Use integration (by slices or shells) to calculate volumes of solids</p> <p>Use integration to calculate surface areas of solids of revolution</p> <p>Use integration to calculate lengths of curves in a plane</p> <p>Adapt knowledge of integral calculus to model problems involving rates of change in a variety of applications, possibly in unfamiliar contexts</p> <p>Find limits of indeterminate forms using l'Hopital's Rule</p> <p>Use little-oh and big-oh notation in determining, investigating, and comparing the rates of growth of functions</p> <p>Use limits to evaluate improper</p>	
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	<p>integrals Use the direct comparison test and the limit comparison test to determine the convergence or divergence of improper integrals Evaluate integrals using partial fractions, integral tables, or trigonometric substitution</p>		<p>integrals Use the direct comparison test and the limit comparison test to determine the convergence or divergence of improper integrals Evaluate integrals using partial fractions, integral tables, or trigonometric substitution</p>	
Problem Solving		<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>		
Reasoning		<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>		
Communication		<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides</p>		
Connections		<p>Lecture Modeling Drill and practice Textbook Projects Showing work—write out problems and steps</p>		

		Provide written explanations and oral explanations Extended response questions Warm-up activities Web support—on-line quizzing, study guides		
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Adopted Instructional Materials

Pre-kindergarten and Kindergarten:

Growing with Mathematics, The Wright Group/McGraw Hill

First Grade through Fifth Grade:

Everyday Mathematics, The Wright Group/McGraw Hill

Sixth Grade through Eighth Grade:

Connected Mathematics Program, Prentice Hall

Accelerated Mathematics, SRA (Supplemental, not primary instructional materials)

Algebra 1, Prentice Hall, 2004 (Honors Algebra, 8th grade)

Ninth Grade through Twelfth Grade:

Pre-Algebra, Prentice Hall, 2004

Algebra 1, Prentice Hall, 2004

Geometry, Prentice Hall, 2004

Geometry, Houghton Mifflin, 1978 (Honors Geometry, 9th grade)

Algebra 2, Prentice Hall, 2004

Precalculus: Numerical, Graphical, Algebraic, Pearson/Prentice Hall, 2004

Calculus: Numerical, Graphical, Algebraic, Prentice Hall, 2003