

Algebra 2

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
2.1.11	Numbers, Number Systems and Number Relationships		
2.1.11.A	Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).	Linear and Quadratic Functions	Solving Quadratic Functions: Section E; pg 1-15
2.2.11	Computation and Estimation		
2.2.11.A	Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.	Systems of Equations and Inequalities	Matrices and Determinants: Section A; pg 1-18
2.2.11.B	Use estimation to solve problems for which an exact answer is not needed.		
2.2.11.C	Construct and apply mathematical models, including lines and curves of best fit, to estimate values of related quantities.		
2.2.11.D	Describe and explain the amount of error that may exist in a computation using estimates.		
2.2.11.E	Recognize that the degree of precision needed in calculating a number depends on how the results will be used and the instruments used to generate the measure.		
2.2.11.F	Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.		
2.3.11	Measurement and Estimation		

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2.3.11.A	Select and use appropriate units and tools to measure to the degree of accuracy required in particular measurement situations.		
2.3.11.B	Measure and compare angles in degrees and radians.	Trigonometric Functions	Basic Angles and Radian Measures: Section B; pg 1-9
2.3.11.C	Demonstrate the ability to produce measures with specified levels of precision.	Trigonometric Functions	Basic Angles and Radian Measures: Section B; pg 1-9
2.4.11	Mathematical Reasoning and Connections		
2.4.11.A	Use direct proofs, indirect proofs or proof by contradiction to validate conjectures.		
2.4.11.B	Construct valid arguments from stated facts.		
2.4.11.C	Determine the validity of an argument.		

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2.4.11.D	Use truth tables to reveal the logic of mathematical statements.		
2.4.11.E	Demonstrate mathematical solutions to problems (e.g., in the physical sciences).		
2.5.11	Mathematical Problem Solving and Communication		
2.5.11.A	Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.	Probability and Statistics	Normal Distribution: Section E; pg 1-11
2.5.11.B	Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.	Conic Sections	Ellipses: Section D; pg 1-13
2.5.11.C	Present mathematical procedures and results clearly, systematically, succinctly and correctly.	Radical Functions	Solving Radical Equations and Inequalities: Section C; pg 1-15
2.5.11.D	Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.	Radical Functions	Solving Radical Equations and Inequalities: Section C; pg 1-15

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2.6.11	Statistics and Data Analysis		
2.6.11.A	Design and conduct an experiment using random sampling. Describe the data as an example of a distribution using statistical measures of center and spread. Organize and represent the results with graphs. (Use standard deviation, variance and t-tests.)	Probability and Statistics	Statistics: Section D; pg 1-14
2.6.11.B	Use appropriate technology to organize and analyze data taken from the local community.		
2.6.11.C	Determine the regression equation of best fit (e.g., linear, quadratic, exponential).		
2.6.11.D	Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.		
2.6.11.E	Determine the validity of the sampling method described in a given study.	Probability and Statistics	Statistics: Section D; pg 1-14
2.6.11.F	Determine the degree of dependence of two quantities specified by a two-way table.		
2.6.11.G	Describe questions of experimental design, control groups, treatment groups, cluster sampling and reliability.		

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2.6.11.H	Use sampling techniques to draw inferences about large populations.		
2.6.11.I	Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.	Probability and Statistics	Normal Distribution: Section E; pg 1-11
2.7.11	Probability and Predictions		
2.7.11.A	Compare odds and probability.	Probability and Statistics	Introduction to Probability: Section A; pg 1-13
2.7.11.B	Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.	Probability and Statistics	Introduction to Probability: Section A; pg 1-13
2.7.11.C	Draw and justify a conclusion regarding the validity of a probability or statistical argument.		
2.7.11.D	Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.	Probability and Statistics	Introduction to Probability: Section A; pg 1-13
2.7.11.E	Solve problems involving independent simple and compound events.	Probability and Statistics	Introduction to Probability: Section A; pg 1-13

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2.8.11	Algebra and Functions		
2.8.11.A	Analyze a given set of data for the existence of a pattern and represent the pattern algebraically and graphically.	Linear and Quadratic Functions	Functions and Relations: Section A; pg 1-19
2.8.11.B	Give examples of patterns that occur in data from other disciplines.		
2.8.11.C	Use patterns, sequences and series to solve routine and non-routine problems.	Discrete Mathematics: Sequences and Series	Arithmetic Sequences and Series: Section A; pg 1-15 Geometric Sequences and Series: Section B; pg 1-18
2.8.11.D	Formulate expressions, equations, inequalities, systems of equations, systems of inequalities and matrices to model routine and non-routine problem situations.	Systems of Equations and Inequalities	Sections A through D
2.8.11.E	Use equations to represent curves (e.g., lines, circles, ellipses, parabolas, hyperbolas).	Conic Sections	Sections A through E
2.8.11.F	Identify whether systems of equations and inequalities are consistent or inconsistent.	Systems of Equations and Inequalities	Systems of Equations: Section B; pg 4
2.8.11.G	Analyze and explain systems of equations, systems of inequalities and matrices.	Systems of Equations and Inequalities	Sections A through D

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2.8.11.H	Select and use an appropriate strategy to solve systems of equations and inequalities using graphing calculators, symbol manipulators, spreadsheets and other software.	Systems of Equations and Inequalities	Systems of Equations: Section B; pg 1-20
2.8.11.I	Use matrices to organize and manipulate data, including matrix addition, subtraction, multiplication and scalar multiplication.	Systems of Equations and Inequalities	Systems of Equations: Section A; pg 1-18
2.8.11.J	Demonstrate the connection between algebraic equations and inequalities and the geometry of relations in the coordinate plane.		
2.8.11.K	Select, justify and apply an appropriate technique to graph a linear function in two variables, including slope-intercept, x- and y-intercepts, graphing by transformations and the use of a graphing calculator.	Linear and Quadratic Functions	Writing and Graphing Linear Functions: Section C; pg 1-19
2.8.11.L	Write the equation of a line when given the graph of the line, two points on the line, or the slope of the line and a point on the line.	Linear and Quadratic Functions	Writing and Graphing Linear Functions: Section C; pg 1-19
2.8.11.M	Given a set of data points, write an equation for a line of best fit.		
2.8.11.N	Solve linear, quadratic and exponential equations both symbolically and graphically.	Linear and Quadratic Functions Exponential and Logarithmic Functions	Solving Linear Equations and Inequalities: Section B; pg 1-17 Solving Quadratic Functions: Section E; pg 1-15 Solving Exponential and Logarithmic Equations: Section E; pg 1-14

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2.8.11.O	Determine the domain and range of a relation, given a graph or set of ordered pairs.	Linear and Quadratic Functions	Functions and Relations: Section A; pg 1-19
2.8.11.P	Analyze a relation to determine whether a direct or inverse variation exists and represent it algebraically and graphically.	Rational Functions	Direct and Inverse Variations: Section A; pg 1-15
2.8.11.Q	Represent functional relationships in tables, charts and graphs.	Linear and Quadratic Functions	Functions and Relations: Section A; pg 1-19
2.8.11.R	Create and interpret functional models.	Linear and Quadratic Functions	Functions and Relations: Section A; pg 1-19
2.8.11.S	Analyze properties and relationships of functions (e.g., linear, polynomial, rational, trigonometric, exponential, logarithmic).	Linear and Quadratic Functions Rational Functions Exponential and Logarithmic Functions Trigonometric Functions	All Sections
2.8.11.T	Analyze and categorize functions by their characteristics.	Linear and Quadratic Functions Rational Functions Exponential and Logarithmic Functions Trigonometric Functions	All Sections
2.9.11	Geometry		

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2.9.11.A	Construct geometric figures using dynamic geometry tools (e.g., Geometer's Sketchpad, Cabri Geometre).		
2.9.11.B	Prove that two triangles or two polygons are congruent or similar using algebraic, coordinate and deductive proofs.		
2.9.11.C	Identify and prove the properties of quadrilaterals involving opposite sides and angles, consecutive sides and angles and diagonals using deductive proofs.	Geometry	Geometry of Quadrilaterals: Section A; pg 1-16
2.9.11.D	Identify corresponding parts in congruent triangles to solve problems.	Geometry	Geometry of Triangles: Section B; pg 1-10
2.9.11.E	Solve problems involving inscribed and circumscribed polygons.		
2.9.11.F	Use the properties of angles, arcs, chords, tangents and secants to solve problems involving circles.	Geometry	Geometry of Circles: Section C; pg 1-17
2.9.11.G	Solve problems using analytic geometry.		
2.9.11.H	Construct a geometric figure and its image using various transformations.		

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2.9.11.I	Model situations geometrically to formulate and solve problems.		
2.9.11.J	Analyze figures in terms of the kinds of symmetries they have.		
2.10.11	Trigonometry		
2.10.11.A	Use graphing calculators to display periodic and circular functions; describe properties of the graphs.		
2.10.11.B	Identify, create and solve practical problems involving right triangles using the trigonometric functions and the Pythagorean Theorem.	Trigonometric Functions	Right Triangle Trigonometry: Section A; pg 1-9
2.11.11	Concepts of Calculus		
2.11.11.A	Determine maximum and minimum values of a function over a specified interval.	Linear and Quadratic Functions	Graphing Zeros and Min/Max Values: Section F; pg 1-14
2.11.11.B	Interpret maximum and minimum values in problem situations.	Linear and Quadratic Functions	Graphing Zeros and Min/Max Values: Section F; pg 1-14

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2.11.11.C	Graph and interpret rates of growth/decay.	Exponential and Logarithmic Functions	Exponential Growth and Decay: Section C; pg 1-14
2.11.11.D	Determine sums of finite sequences of numbers and infinite geometric series.	Discrete Mathematics: Sequences and Series	Arithmetic Sequences and Series: Section A; pg 1-15 Geometric Sequences and Series: Section B; pg 1-18
2.11.11.E	Estimate areas under curves using sequences of areas.		