PA Core Standards For Mathematics
Curriculum Framework
Algebra 2

Grade	Big Idea	Essential Questions	Concepts	Competencies	Standard	Eligible Content	Vocabulary
ALG 2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations? What does it mean to estimate or analyze numerical quantities? What makes a tool and/or strategy appropriate for a given task?	Complex Number System	Represent and/or use imaginary numbers in equivalent forms. Simplify/evaluate expressions involving imaginary numbers. Perform arithmetic operations and apply to complex numbers.	CC.2.1.HS.F.6 CC.2.1.HS.F.7	A2.1.1.1.1 A2.1.1.1.2 A2.1.1.2.1 A2.1.1.2.2	Asymptote Binomial Combination Common Logarithm Complex Number System Compound Events Dependent/Independent Events Dilation Exponential Exponential Decay Exponential Function Exponential Growth Expression Extrema Geometric Sequence Imaginary Number Increasing/Decreasing Intervals Intercept Inverse of a Function Logarithm Natural Logarithm Negative Exponents Observational Study Outcomes Perfect Square Trinomial Permutation Polynomial Polynomial Identity Probability Quadratic Formula Quadratic Function Radical Functions Rational Functions Reflection

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							Regression Models Root Functions Sample Survey Scatterplot Standard Deviation Statistical Experiment Transformation Translations Trinomial Unit Circle
ALG 2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations? What makes a tool and/or strategy appropriate for a given task?	Polynomial and Rational Expressions	Perform arithmetic operations on polynomials. Understand the relationship between zeros and factors of polynomials. Rewrite rational expressions. Simplify/factor expressions involving polynomials.	CC.2.1.HS.F.1 CC.2.1.HS.D.1 CC.2.1.HS.D.2 CC.2.1.HS.D.3 CC.2.1.HS.D.4 CC.2.1.HS.D.5 CC.2.1.HS.D.6	A2.1.2.1.2 A2.1.3.1.2 A2.1.2.2.1 A2.1.2.2.2	
ALG 2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically?	Equations and Inequalities	Create and/or solve equations (including literal, polynomial, rational, radical, exponential, and logarithmic) both algebraically and graphically. Use and/or explain reasoning while solving equations, and justify the solution method.	CC.2.1.HS.F.1 CC.2.1.HS.D.1 CC.2.1.HS.D.2	A2.1.2.1.3 A2.1.2.1.4 A2.1.2.2.2 A2.1.3.1.1 A2.1.3.1.3 A2.1.3.1.4 A2.1.3.2.1 A2.1.3.2.2 A2.2.2.1.2	

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	situations. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.	How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations? What makes a tool and/or strategy appropriate for a given task?		Determine how a change in one variable relates to a change in a second variable. Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems.		A2.2.2.1.3	
ALG 2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?	Equations and Inequalities	Create and/or solve equations (including literal, polynomial, rational, radical, exponential, and logarithmic) both algebraically and graphically. Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. Use and/or explain reasoning while solving equations, and justify the solution method. Determine how a change in one variable relates to a change in a second variable.	CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10	A2.1.2.1.3 A2.1.2.1.4 A2.1.2.2.2 A2.1.3.1.1 A2.1.3.1.3 A2.1.3.1.4 A2.1.3.2.1 A2.1.3.2.2 A2.2.2.1.2 A2.2.2.1.3	
ALG 2	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	How is mathematics used to quantify, compare, represent, and model numbers? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?	Functions	Use the concept and notation of function to interpret and apply them in terms of their context. Using the unit circle, extend the domain of trigonometric functions to all real numbers. Interpret functions in terms of the situations they model.	CC.2.2.HS.C.1 CC.2.2.HS.C.2 CC.2.2.HS.C.3 CC.2.2.HS.C.4 CC.2.2.HS.C.5 CC.2.2.HS.C.6 CC.2.2.HS.C.7 CC.2.2.HS.C.8 CC.2.2.HS.C.9	A2.2.1.1.3 A2.2.1.1.4 A2.2.2.1.1 A2.2.2.1.2 A2.2.2.1.3 A2.2.2.1.4 A2.2.2.2.1	

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	Patterns exhibit relationships that can be extended, described, and generalized. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How can recognizing repetition or regularity assist in solving problems more efficiently? How can patterns be used to describe relationships in mathematical situations? How can data be organized and represented to provide insight into the relationship between quantities? How does the type of data influence the choice of display? How can probability and data analysis be used to make predictions?		Use trigonometric functions to model periodic phenomena. Prove the Pythagorean identity and use it to calculate trigonometric ratios. Create and/or analyze functions using multiple representations (graph, table, and equation). Create a function and/or sequence that model a relationship between two quantities. Create new functions from existing functions (transformations and/or inverses of functions). Construct and compare linear, quadratic, exponential, and logarithmic models to solve problems.			
ALG 2	Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools. Measurement attributes can be quantified, and estimated using customary	What makes a tool and/or strategy appropriate for a given task? In what ways are the mathematical attributes of objects or processes measured, calculated and/or interpreted? How precise do measurements	Data	Analyze a set of data for a pattern, and represent the pattern with an algebraic rule and/or a graph. Summarize, represent, and interpret single-variable data (including standard deviation) and two-variable data.	CC.2.3.HS.B.1 CC.2.4.HS.B.2 CC.2.4.HS.B.3 CC.2.4.HS.B.4 CC.2.4.HS.B.5 CC.2.4.HS.B.6 CC.2.4.HS.B.7	A2.2.1.1.1 A2.2.1.1.2 A2.2.3.1.1 A2.2.3.1.2	

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	and non-customary units of measure. Patterns exhibit relationships that can be extended, described, and generalized. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	and calculations need to be? How can patterns be used to describe relationships in mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently? How can data be organized and represented to provide insight into the relationship between quantities? How does the type of data influence the choice of display? How can probability and data analysis be used to make predictions?		Analyze and/or interpret data on a scatter plot and/or use it to make predictions (e.g., regression). Recognize and evaluate random processes underlying statistical experiments. Make inferences and justify conclusions based on sample surveys, experiments, and observational studies. Use the concepts of independence and conditional probability to interpret data.			
ALG 2	Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools. Measurement attributes can be quantified, and estimated using customary and non-customary units of measure.	What makes a tool and/or strategy appropriate for a given task? In what ways are the mathematical attributes of objects or processes measured, calculated and/or interpreted? How precise do measurements and calculations need to be?	Probability	Apply the rules of probability to compute probabilities of compound events. Calculate probability and/or odds. Use combinations, permutations, and the fundamental counting principle to solve problems involving probability.	CC.2.4.HS.F.3 CC.2.4.HS.F.5	A2.2.3.2.1 A2.2.3.2.2 A2.2.3.2.3	

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	Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. Data can be modeled and used to make inferences.	How can data be organized and represented to provide insight into the relationship between quantities? How does the type of data influence the choice of display? How can probability and data analysis be used to make predictions?					