Standards for Mathematical Practice - ***ALL math practice standards covered in ALL math courses at HPHS.***		
MP1	Make sense of problems and persevere in solving them.	
MP2	Reason abstractly and quantitatively.	
MP3	Construct viable arguments and critique the reasoning of others.	
MP4	Model with mathematics.	
MP5	Use appropriate tools strategically.	
MP6	Attend to precision.	
MP7	Look for and make use of structure.	
MP8	Look for and express regularity in repeated reasoning.	

Mathematical Practices		**Engagement Indicators in Students***
Overarching habits of mind of a productive thinker	**MP1:** Make sense of problems and persevere in solving them.	Understand the meaning of the problem and look for entry points to its solution
		Analyze information (givens, constrains, relationships, goals)
		Make conjectures and plan a solution pathway
		Monitor and evaluate the progress and change course as necessary
		Check answers to problems and ask, “Does this make sense?”
	MP6: Attend to precision.	Communicate precisely using clear definitions
		State the meaning of symbols, carefully specifying units of measure, and providing accurate labels
		Calculate accurately and efficiently, expressing numerical answers with a degree of precision
		Provide carefully formulated explanations
		Label accurately when measuring and graphing
Reasoning and Explaining	**MP2:** Reason abstractly and quantitatively.	Make sense of quantities and relationships in problem situations
		Represent abstract situations symbolically and understand the meaning of quantities
		Create a coherent representation of the problem at hand
		Consider the units involved
		Flexibly use properties of operations
	MP3: Construct viable arguments and critique the reasoning of others.	Use definitions and previously established causes/effects (results) in constructing arguments
		Make conjectures and use counterexamples to build a logical progression of statements to explore and support ideas
		Communicate and defend mathematical reasoning using objects, drawings, diagrams, and/or actions
		Listen to or read the arguments of others
		Decide if the arguments of others make sense and ask probing questions to clarify or improve the arguments
	MP4: Model with mathematics.	Apply prior knowledge to solve real world problems

Modeling and Using Tools		Identify important quantities and map their relationships using such tools as diagrams, two way tables, graphs, flowcharts, and/or formulas
		Use assumptions and approximations to make a problem simpler
		Check to see if an answer makes sense within the context of a situation and change a model when necessary
	MP5: Use appropriate tools strategically.	Make sound decisions about the use of specific tools (Examples might include: calculator, concrete models, digital technologies, pencil/paper, ruler, compass, protractor)
		Use technological tools to visualize the results of assumptions, explore consequences, and compare predications with data
		Identify relevant external math resources (digital content on a website) and use them to pose or solve problems
		Use technological tools to explore and deepen understanding of concepts
Seeing structure and generalizing	**MP7:** Look for and make use of structure.	Look for patterns or structure, recognizing that quantities can be represented in different ways
		Recognize the significance in concepts and models and use the patterns or structure for solving related problems
		View complicated quantities both as single objects or compositions of several objects and use operations to make sense of problems
	MP8: Look for and express regularity in repeated reasoning.	Notice repeated calculations and look for general methods and shortcuts
		Continually evaluate the reasonableness of intermediate results (comparing estimates), while attending to details, and make generalizations based on findings
		*All indicators are not necessary for providing full evidence of practice(s). Each practice may not be evident during every lesson.

HPHS ALGEBRA I

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Quantities*	Reason quantitatively and use units to solve problems.	N.Q.1 (PR)	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
Mathematics	HS	Quantities*	Reason quantitatively and use units to solve problems.	N.Q.2 (PR)	Define appropriate quantities for the purpose of descriptive modeling.
Mathematics	HS	Quantities*	Reason quantitatively and use units to solve problems.	N.Q.3 (PR)	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 (PR)	Interpret expressions that represent a quantity in terms of its context.★
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 a. (PR)	Interpret parts of an expression, such as terms, factors, and coefficients.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 b. (PR)	Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.2 (PR)	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 (PR)	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 a. (PR)	Factor a quadratic expression to reveal the zeros of the function it defines.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Perform arithmetic operations on polynomials.	A.APR.1 (PR)	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.1 (PR)	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.2 (PR)	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.3 (PR)	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
Mathematics	HS	Reasoning with Equations and Inequalities	Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.1 (PR)	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.3 (PR)	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 (PR)	Solve quadratic equations in one variable.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.6 (PR)	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.10 (PR)	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.11 (PR)	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.12 (PR)	Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
Mathematics	HS	Interpreting Functions	Understand the concept of a function and use function notation.	F.IF.1 (PR)	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).

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Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Interpreting Functions	Understand the concept of a function and use function notation.	F.IF.2 (PR)	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.4 (PR)	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.5 (PR)	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.6 (PR)	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 a. (PR)	Graph linear and quadratic functions and show intercepts, maxima, and minima.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 (PR)	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 a. (PR)	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 b. (PR)	Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.9 (PR)	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 (PR)	Write a function that describes a relationship between two quantities.★
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 b. (PR)	Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.3 (PR)	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 a. (PR)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 b. (PR)	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 c. (PR)	Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.2 (PR)	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.3 (PR)	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
Mathematics	HS	Linear and Exponential Models*	Interpret expressions for functions in terms of the situation they model.	F.LE.5 (PR)	Interpret the parameters in a linear or exponential function in terms of a context.
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.1 (PR)	Represent data with plots on the real number line (dot plots, histograms, and box plots).
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.2 (PR)	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.3 (PR)	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on two categorical and quantitative variables.	S.ID.6 (PR)	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

HPHS ALGEBRA I

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on two categorical and quantitative variables.	S.ID.6 a. (PR)	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.	
Mathematics	HS	Interpreting Categorical and Quantitative Data	Interpret linear models.	S.ID.7 (PR)	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context	
Mathematics	HS	Interpreting Categorical and Quantitative Data	Interpret linear models.	S.ID.9 (PR)	Distinguish between correlation and causation.	

HPHS GEOMETRY

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Quantities*	Reason quantitatively and use units to solve problems.	N.Q.1 (PR)	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.1 (PR)	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.2 (PR)	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.5 (PR)	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.6 (PR)	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.9 (PR)	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.10 (PR)	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor:
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.1 a.	A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.1 b.	The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.2 (PR)	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Prove theorems involving similarity.	G.SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Prove theorems involving similarity.	G.SRT.5 (PR)	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.6 (PR)	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.8 (PR)	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.«
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

HPHS GEOMETRY

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Circles	Understand and apply theorems about circles.	G.C.2 (PR)	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
Mathematics	HS	Circles	Find arc lengths and areas of sectors of circles.	G.C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
Mathematics	HS	Expressing Geometric Properties with Equations	Translate between the geometric description and the equation for a conic section.	G.GPE.1 (PR)	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, Ö3) lies on the circle centered at the origin and containing the point (0, 2).
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★
Mathematics	HS	Geometric Measurement and Dimension	Explain volume formulas and use them to solve problems.	G.GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★
Mathematics	HS	Modeling with Geometry	Apply geometric concepts in modeling situations.	G.MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).★
Mathematics	HS	Modeling with Geometry	Apply geometric concepts in modeling situations.	G.MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).★

HPHS GEOMETRY HONORS

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.1 (PR)	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.2 (PR)	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.5 (PR)	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.6 (PR)	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.9 (PR)	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.10 (PR)	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.2 (PR)	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Prove theorems involving similarity.	G.SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Prove theorems involving similarity.	G.SRT.5 (PR)	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.6 (PR)	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.8 (PR)	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.«
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).
Mathematics	HS	Circles	Understand and apply theorems about circles.	G.C.1	Prove that all circles are similar.
Mathematics	HS	Circles	Understand and apply theorems about circles.	G.C.2 (PR)	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

HPHS GEOMETRY HONORS

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Circles	Find arc lengths and areas of sectors of circles.	G.C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
Mathematics	HS	Expressing Geometric Properties with Equations	Translate between the geometric description and the equation for a conic section.	G.GPE.1 (PR)	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, Ö3) lies on the circle centered at the origin and containing the point (0, 2).
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★
Mathematics	HS	Geometric Measurement and Dimension	Explain volume formulas and use them to solve problems.	G.GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★
Mathematics	HS	Modeling with Geometry	Apply geometric concepts in modeling situations.	G.MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).★
Mathematics	HS	Modeling with Geometry	Apply geometric concepts in modeling situations.	G.MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).★

HPHS ALGEBRA 2

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	The Real Number System	Extend the properties of exponents to rational exponents.	N.RN.2 (PR)	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.1 (PR)	Know there is a complex number i such that i^2 = –1, and every complex number has the form a + bi with a and b real.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.2 (PR)	Use the relation i^2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.7 (PR)	Solve quadratic equations with real coefficients that have complex solutions.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 a. (PR)	Interpret parts of an expression, such as terms, factors, and coefficients.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 b. (PR)	Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.2 (PR)	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 a. (PR)	Factor a quadratic expression to reveal the zeros of the function it defines.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 b. (PR)	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 c. (PR)	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈1. 01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Perform arithmetic operations on polynomials.	A.APR.1 (PR)	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.1 (PR)	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.2 (PR)	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.3 (PR)	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
Mathematics	HS	Reasoning with Equations and Inequalities	Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.1 (PR)	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
Mathematics	HS	Reasoning with Equations and Inequalities	Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 (PR)	Solve quadratic equations in one variable.

HPHS ALGEBRA 2

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 b.	Solve quadratic equations by inspection (e.g., for x^2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.6 (PR)	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.11 (PR)	Explain why the x-coordinates of the points where the graphs of the equations y = f (x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.4 (PR)	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.5 (PR)	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.6 (PR)	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 c. (PR)	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 e. (PR)	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 (PR)	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 a. (PR)	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 b. (PR)	Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.9 (PR)	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 (PR)	Write a function that describes a relationship between two quantities.★
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 b. (PR)	Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.3 (PR)	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

HPHS ALGEBRA 2

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 a.	Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠1.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 (PR)	Distinguish between situations that can be modeled with linear functions and with exponential functions.
Mathematics	HS	Trigonometric Functions	Extend the domain of trigonometric functions using the unit circle.	F.TF.1 (PR)	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
Mathematics	HS	Making Inferences and Justifying Conclusions	Understand and evaluate random processes underlying statistical experiments.	S.IC.1 (PR)	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
Mathematics	HS	Making Inferences and Justifying Conclusions	Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	S.IC.3 (PR)	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

HPHS ALGEBRA 2 WITH TRIGONOMETRY					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	The Real Number System	Extend the properties of exponents to rational exponents.	N.RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.
Mathematics	HS	The Real Number System	Extend the properties of exponents to rational exponents.	N.RN.2 (PR)	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
Mathematics	HS	The Real Number System	Use properties of rational and irrational numbers.	N.RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.1 (PR)	Know there is a complex number i such that i^2 = –1, and every complex number has the form a + bi with a and b real.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.2 (PR)	Use the relation i^2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.3	(+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.7 (PR)	Solve quadratic equations with real coefficients that have complex solutions.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 a. (PR)	Interpret parts of an expression, such as terms, factors, and coefficients.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 b. (PR)	Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.2 (PR)	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 (PR)	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 a. (PR)	Factor a quadratic expression to reveal the zeros of the function it defines.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 b. (PR)	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 c. (PR)	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈1. 01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Perform arithmetic operations on polynomials.	A.APR.1 (PR)	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Rewrite rational expressions.	A.APR.7	(+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

HPHS ALGEBRA 2 WITH TRIGONOMETRY

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.1 (PR)	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.2 (PR)	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.3 (PR)	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
Mathematics	HS	Reasoning with Equations and Inequalities	Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 (PR)	Solve quadratic equations in one variable.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 a.	Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)^2 = q that has the same solutions. Derive the quadratic formula from this form.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 b.	Solve quadratic equations by inspection (e.g., for x^2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.6 (PR)	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.11 (PR)	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.12 (PR)	Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.4 (PR)	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.5 (PR)	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.6 (PR)	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 c. (PR)	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 e. (PR)	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 (PR)	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

HPHS ALGEBRA 2 WITH TRIGONOMETRY					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 a. (PR)	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 b. (PR)	Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.9 (PR)	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 (PR)	Write a function that describes a relationship between two quantities.★
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 b. (PR)	Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.3 (PR)	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4	Find inverse functions.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 a.	Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠1.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 b.	(+) Verify by composition that one function is the inverse of another.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 (PR)	Distinguish between situations that can be modeled with linear functions and with exponential functions.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.4	For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
Mathematics	HS	Trigonometric Functions	Extend the domain of trigonometric functions using the unit circle.	F.TF.1 (PR)	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
Mathematics	HS	Making Inferences and Justifying Conclusions	Understand and evaluate random processes underlying statistical experiments.	S.IC.1 (PR)	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
Mathematics	HS	Making Inferences and Justifying Conclusions	Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	S.IC.3 (PR)	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

HPHS ALGEBRA 2 WITH TRIGONOMETRY HONORS					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	The Real Number System	Extend the properties of exponents to rational exponents.	N.RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.
Mathematics	HS	The Real Number System	Extend the properties of exponents to rational exponents.	N.RN.2 (PR)	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
Mathematics	HS	The Real Number System	Use properties of rational and irrational numbers.	N.RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.1 (PR)	Know there is a complex number i such that i^2 = –1, and every complex number has the form a + bi with a and b real.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.2 (PR)	Use the relation i^2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.3	(+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.7 (PR)	Solve quadratic equations with real coefficients that have complex solutions.
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.8	(+) Extend polynomial identities to the complex numbers. For example, rewrite x^2 + 4 as (x + 2i)(x – 2i).
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.9	(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.7	(+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.8	(+) Add, subtract, and multiply matrices of appropriate dimensions.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.9	(+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.10	(+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 a. (PR)	Interpret parts of an expression, such as terms, factors, and coefficients.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 b. (PR)	Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.2 (PR)	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 (PR)	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 a. (PR)	Factor a quadratic expression to reveal the zeros of the function it defines.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 b. (PR)	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 c. (PR)	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈1. 01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.

HPHS ALGEBRA 2 WITH TRIGONOMETRY HONORS					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Perform arithmetic operations on polynomials.	A.APR.1 (PR)	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Use polynomial identities to solve problems.	A.APR.5	(+) Know and apply the Binomial Theorem for the expansion of (x + y)n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle. (The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.)
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Rewrite rational expressions.	A.APR.6	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q (x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r (x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Rewrite rational expressions.	A.APR.7	(+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.1 (PR)	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.2 (PR)	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.3 (PR)	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
Mathematics	HS	Reasoning with Equations and Inequalities	Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 (PR)	Solve quadratic equations in one variable.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 a.	Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)^2 = q that has the same solutions. Derive the quadratic formula from this form.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 b.	Solve quadratic equations by inspection (e.g., for x^2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.6 (PR)	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.8	(+) Represent a system of linear equations as a single matrix equation in a vector variable.
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.9	(+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).

HPHS ALGEBRA 2 WITH TRIGONOMETRY HONORS					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.11 (PR)	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.12 (PR)	Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.4 (PR)	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.5 (PR)	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.6 (PR)	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 c. (PR)	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 e. (PR)	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 (PR)	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 a. (PR)	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 b. (PR)	Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.9 (PR)	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 (PR)	Write a function that describes a relationship between two quantities.★
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 b. (PR)	Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 c. (PR)	(+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.3 (PR)	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

HPHS ALGEBRA 2 WITH TRIGONOMETRY HONORS					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4	Find inverse functions.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 a.	Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠1.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 b.	(+) Verify by composition that one function is the inverse of another.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 c.	(+) Read values of an inverse function from a graph or a table, given that the function has an inverse.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 d.	(+) Produce an invertible function from a non-invertible function by restricting the domain.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.5	(+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 (PR)	Distinguish between situations that can be modeled with linear functions and with exponential functions.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.4	For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
Mathematics	HS	Trigonometric Functions	Extend the domain of trigonometric functions using the unit circle.	F.TF.1 (PR)	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.8 (PR)	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.«
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.9	(+) Derive the formula A = 1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).
Mathematics	HS	Expressing Geometric Properties with Equations	Translate between the geometric description and the equation for a conic section.	G.GPE.1 (PR)	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
Mathematics	HS	Expressing Geometric Properties with Equations	Translate between the geometric description and the equation for a conic section.	G.GPE.2	Derive the equation of a parabola given a focus and directrix.
Mathematics	HS	Expressing Geometric Properties with Equations	Translate between the geometric description and the equation for a conic section.	G.GPE.3	(+)Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on two categorical and quantitative variables.	S.ID.6 c.	Fit a linear function for a scatter plot that suggests a linear association.
Mathematics	HS	Interpreting Categorical and Quantitative Data	Interpret linear models.	S.ID.7 (PR)	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
Mathematics	HS	Making Inferences and Justifying Conclusions	Understand and evaluate random processes underlying statistical experiments.	S.IC.1 (PR)	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
Mathematics	HS	Making Inferences and Justifying Conclusions	Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	S.IC.3 (PR)	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
Mathematics	HS	Conditional Probability and the Rules of Probability	Understand independence and conditional probability and use them to interpret data.	S.CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).

HPHS TRIGONOMETRY & RELATED TOPICS

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 a. (PR)	Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 b. (PR)	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 d. (PR)	(+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 c. (PR)	(+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.4	For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.8 (PR)	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.«
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

HPHS PRECALCULUS					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.8	(+) Extend polynomial identities to the complex numbers. For example, rewrite x^2 + 4 as (x + 2i)(x – 2i).
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.9	(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 a. (PR)	Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 b. (PR)	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 c. (PR)	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈1. 01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Rewrite rational expressions.	A.APR.6	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q (x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r (x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 d. (PR)	(+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 c. (PR)	(+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4	Find inverse functions.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 a.	Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠1.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 b.	(+) Verify by composition that one function is the inverse of another.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 c.	(+) Read values of an inverse function from a graph or a table, given that the function has an inverse.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 d.	(+) Produce an invertible function from a non-invertible function by restricting the domain.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.5	(+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.4	For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

HPHS PRECALCULUS ADVANCED					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	The Complex Number System	Represent complex numbers and their operations on the complex plane.	N.CN.4	(+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.8	(+) Extend polynomial identities to the complex numbers. For example, rewrite x^2 + 4 as (x + 2i)(x – 2i).
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.9	(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.1	(+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, |v|, ||v||, v).
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.2	(+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.3	(+) Solve problems involving velocity and other quantities that can be represented by vectors.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 (PR)	(+) Add and subtract vectors.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 a. (PR)	Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 b. (PR)	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 c.	Understand vector subtraction v – w as v + (–w), where –w is the additive inverse of w, with the same magnitude as w and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5	(+) Multiply a vector by a scalar.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5 a.	Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as c (vx, vy) = (cvx, cvy).
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5 b.	Compute the magnitude of a scalar multiple cv using ||cv|| = |c|v. Compute the direction of cv knowing that when |c|v ≠0, the direction of cv is either along v (for c > 0) or against v (for c < 0).
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 c. (PR)	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈1. 01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Rewrite rational expressions.	A.APR.6	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q (x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r (x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.3 (PR)	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 d. (PR)	(+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

HPHS PRECALCULUS ADVANCED					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 a.	Determine an explicit expression, a recursive process, or steps for calculation from a context.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 c. (PR)	(+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4	Find inverse functions.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 a.	Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠1.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 b.	(+) Verify by composition that one function is the inverse of another.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 c.	(+) Read values of an inverse function from a graph or a table, given that the function has an inverse.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 d.	(+) Produce an invertible function from a non-invertible function by restricting the domain.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.5	(+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.4	For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

HPHS PRECALCULUS ADVANCED					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	The Complex Number System	Represent complex numbers and their operations on the complex plane.	N.CN.4	(+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.
Mathematics	HS	The Complex Number System	Represent complex numbers and their operations on the complex plane.	N.CN.5	(+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, (-1 + 3i)^3 = 8 because (-1 + 3i) has modulus 2 and argument 120°.
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.8	(+) Extend polynomial identities to the complex numbers. For example, rewrite x^2 + 4 as (x + 2i)(x – 2i).
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.9	(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.1	(+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, |v|, ||v||, v).
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.2	(+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.3	(+) Solve problems involving velocity and other quantities that can be represented by vectors.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 (PR)	(+) Add and subtract vectors.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 a. (PR)	Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 b. (PR)	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 c.	Understand vector subtraction v – w as v + (–w), where –w is the additive inverse of w, with the same magnitude as w and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5	(+) Multiply a vector by a scalar.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5 a.	Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as c (vx, vy) = (cvx, cvy).
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5 b.	Compute the magnitude of a scalar multiple cv using ||cv|| = |c|v. Compute the direction of cv knowing that when |c|v ≠0, the direction of cv is either along v (for c > 0) or against v (for c < 0).
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Rewrite rational expressions.	A.APR.6	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q (x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r (x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 d. (PR)	(+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 a.	Determine an explicit expression, a recursive process, or steps for calculation from a context.

HPHS PRECALCULUS ADVANCED					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 c. (PR)	(+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4	Find inverse functions.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 a.	Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠1.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 b.	(+) Verify by composition that one function is the inverse of another.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 c.	(+) Read values of an inverse function from a graph or a table, given that the function has an inverse.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 d.	(+) Produce an invertible function from a non-invertible function by restricting the domain.
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.5	(+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).

HPHS INTRO TO COMPUTER SCIENCE					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Computer Science	9-10	Computing Systems	Devices	9-10.CS.01	Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects
Computer Science	9-10	Computing Systems	Hardwarde and Software	9-10.CS.02	Compare levels of abstraction and interactions between application software, system software, and hardware layers.
Computer Science	9-10	Computing Systems	Troubleshooting	9-10.CS.03	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.
Computer Science	9-10	Networks and the Internet	Network Communication and Organization	9-10.NI.05	Give examples to illustrate how sensitive data can be affected by malware and other attacks.
Computer Science	9-10	Networks and the Internet	Network Communication and Organization	9-10.NI.06	Compare various security measures, considering tradeoffs between the usability and security of a computing system.
Computer Science	9-10	Networks and the Internet	Cybersecurity	9-10.NI.08	Explain tradeoffs when selecting and implementing cybersecurity recommendations.
Computer Science	9-10	Data and Analysis	Storage	9-10.DA.09	Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.
Computer Science	9-10	Data and Analysis	Storage	9-10.DA.10	Evaluate the tradeoffs in how data elements are organized and stored. Collection, Visualization, and Transformation
Computer Science	9-10	Data and Analysis	Collection, Visualization, and Transformation	9-10.DA.11	Create interactive data visualizations using software tools to help others better understand real-world phenomena.
Computer Science	9-10	Algorithms and Programming	Algorithms	9-10.AP.13	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.
Computer Science	9-10	Algorithms and Programming	Control	9-10.AP.15	Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.
Computer Science	9-10	Algorithms and Programming	Control	9-10.AP.16	Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.
Computer Science	9-10	Algorithms and Programming	Control	9-10.AP.17	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, or objects.
Computer Science	9-10	Algorithms and Programming	Modularity	9-10.AP.18	Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.
Computer Science	9-10	Algorithms and Programming	Modularity	9-10.AP.19	Systematically design and develop programs for broad audiences by incorporating feedback from users.
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.21	Evaluate and refine computational artifacts to make them more usable and accessible.
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.22	Design and develop computational artifacts working in team roles using collaborative tools.
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.23	Document design decisions using text, graphics, presentations, or demonstrations in the development of complex programs.

HPHS INTRO TO COMPUTER SCIENCE					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.24	Describe the characteristics and evaluate the impact of human computer interaction.
Computer Science	9-10	Impacts of Computing	Culture	9-10.IC.25	Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices. Evaluate the ways digital social interactions impact personal, ethical, social, economic, and cultural practices.
Computer Science	9-10	Impacts of Computing	Social Interactions	9-10.IC.28	Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.
Computer Science	9-10	Impacts of Computing	Safety Law and Ethics	9-10.IC.30	Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.
Computer Science	9-10	Impacts of Computing	Safety Law and Ethics	9-10.IC.31	Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.
Computer Science	9-10	Emerging and Future Technologies	Emerging and Future Technologies	9-10.ET.E	Create new or original work by applying emerging technologies.
Computer Science	11-12	Computing Systems	Devices	11-12.CS.01	Compare the characteristics and uses of traditional and emerging computing devices and systems.
Computer Science	11-12	Computing Systems	Hardware and Software	11-12.CS.02	Categorize the roles of operating system software.
Computer Science	11-12	Computing Systems	Troubleshooting	11-12.CS.03	Illustrate ways computing systems implement logic, input, and output through hardware components.
Computer Science	11-12	Networks and the Internet	Cybersecurity	11-12.NI.05	Compare ways software developers protect devices and information from unauthorized access.
Computer Science	11-12	Data and Analysis	Collection, Visualization, and Transformation	11-12.DA.06	Use data analysis tools and techniques to identify patterns in data representing complex systems.
Computer Science	11-12	Data and Analysis	Collection, Visualization, and Transformation	11-12.DA.07	Select data collection tools and techniques to generate data sets that support a claim or communicate information.
Computer Science	11-12	Data and Analysis	Collection, Visualization, and Transformation	11-12.DA.08	Analyze the ways in which automated data collection is utilized in society.
Computer Science	11-12	Data and Analysis	Interference and Models	11-12.DA.09	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.
Computer Science	11-12	Algorithms and Programming	Modularity	11-12.AP.16	Construct solutions to problems using student-created components, such as procedures, modules, or objects.
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.19	Plan and develop programs for broad audiences using a software life cycle process.
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.21	Explain security issues that might lead to compromised computer programs.
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.22	Develop programs for multiple computing platforms.
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.25	Discuss social, economic, and ethical consequences of malfunctional software and software updates.

HPHS INTRO TO COMPUTER SCIENCE					
Subject	**Grade**	**Domain**	**Cluster Statement**	**Standard Code**	**Common Core Standard**
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.27	Evaluate key qualities of a program through a process such as a code review.
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.28	Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.
Computer Science	11-12	Impacts of Computing	Culture	11-12.IC.31	Predict how computational innovations that have revolutionized aspects of our culture might evolve.
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.A	Explain that the field of emerging technologies will be evolving and rapidly growing.
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.B	Compare existing and emerging technologies, ideas, and concepts.
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.C	Describe how emerging technologies are influencing current events at a local and global scale.
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.E	Create new or original work by applying emerging technologies.

AP Course	Link to Course Framework
AP Calculus AB	AP Calculus AB Course
AP Calculus BC	AP Calculus BC Course
AP Statistics	AP Statistics Course Framework
AP Computer Science Principles	APCSP Course Framework
AP Computer Science A	AP CS A Course Framework

ISBE PRIORITY STANDARDS

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard
Mathematics	HS	The Real Number System	Extend the properties of exponents to r	N.RN.2 (PR)	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
Mathematics	HS	Quantities*	Reason quantitatively and use units to	N.Q.1 (PR)	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
Mathematics	HS	Quantities*	Reason quantitatively and use units to	N.Q.2 (PR)	Define appropriate quantities for the purpose of descriptive modeling.
Mathematics	HS	Quantities*	Reason quantitatively and use units to	N.Q.3 (PR)	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with com	N.CN.1 (PR)	Know there is a complex number i such that i^2 = –1, and every complex number has the form a + bi with a and b real.
Mathematics	HS	The Complex Number System	Perform arithmetic operations with com	N.CN.2 (PR)	Use the relation i^2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial id	N.CN.7 (PR)	Solve quadratic equations with real coefficients that have complex solutions.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 (PR)	(+) Add and subtract vectors.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 a. (PR)	Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 b. (PR)	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 (PR)	Interpret expressions that represent a quantity in terms of its context.★
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 a. (PR)	Interpret parts of an expression, such as terms, factors, and coefficients.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 b. (PR)	Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.2 (PR)	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms t	A.SSE.3 (PR)	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms t	A.SSE.3 a. (PR)	Factor a quadratic expression to reveal the zeros of the function it defines.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms t	A.SSE.3 b. (PR)	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms t	A.SSE.3 c. (PR)	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms t	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★
Mathematics	HS	Arithmetic with Polynomials and Ration	Perform arithmetic operations on polyn	A.APR.1 (PR)	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Mathematics	HS	Arithmetic with Polynomials and Ration	Understand the relationship between z	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
Mathematics	HS	Creating Equations*	Create equations that describe number	A.CED.1 (PR)	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
Mathematics	HS	Creating Equations*	Create equations that describe number	A.CED.2 (PR)	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
Mathematics	HS	Creating Equations*	Create equations that describe number	A.CED.3 (PR)	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
Mathematics	HS	Reasoning with Equations and Inequali	Understand solving equations as a pro	A.REI.1 (PR)	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
Mathematics	HS	Reasoning with Equations and Inequali	Solve equations and inequalities in one	A.REI.3 (PR)	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
Mathematics	HS	Reasoning with Equations and Inequali	Solve equations and inequalities in one	A.REI.4 (PR)	Solve quadratic equations in one variable.
Mathematics	HS	Reasoning with Equations and Inequali	Solve systems of equations.	A.REI.6 (PR)	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
Mathematics	HS	Reasoning with Equations and Inequali	Represent and solve equations and ine	A.REI.10 (PR)	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

Mathematics	HS	Reasoning with Equations and Inequali	Represent and solve equations and ine	A.REI.11 (PR)	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★
Mathematics	HS	Reasoning with Equations and Inequali	Represent and solve equations and ine	A.REI.12 (PR)	Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
Mathematics	HS	Interpreting Functions	Understand the concept of a function a	F.IF.1 (PR)	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
Mathematics	HS	Interpreting Functions	Understand the concept of a function a	F.IF.2 (PR)	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applicat	F.IF.4 (PR)	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applicat	F.IF.5 (PR)	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applicat	F.IF.6 (PR)	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.7 (PR)	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.7 a. (PR)	Graph linear and quadratic functions and show intercepts, maxima, and minima.
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.7 c. (PR)	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.7 d. (PR)	(+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.7 e. (PR)	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.8 (PR)	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.8 a. (PR)	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.8 b. (PR)	Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.
Mathematics	HS	Interpreting Functions	Analyze functions using different repres	F.IF.9 (PR)	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.
Mathematics	HS	Building Functions	Build a function that models a relations	F.BF.1 (PR)	Write a function that describes a relationship between two quantities.★
Mathematics	HS	Building Functions	Build a function that models a relations	F.BF.1 b. (PR)	Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.
Mathematics	HS	Building Functions	Build a function that models a relations	F.BF.1 c. (PR)	(+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.
Mathematics	HS	Building Functions	Build new functions from existing functi	F.BF.3 (PR)	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and expo	F.LE.1 (PR)	Distinguish between situations that can be modeled with linear functions and with exponential functions.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and expo	F.LE.1 a. (PR)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and expo	F.LE.1 b. (PR)	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and expo	F.LE.1 c. (PR)	Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and expo	F.LE.2 (PR)	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and expo	F.LE.3 (PR)	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
Mathematics	HS	Linear and Exponential Models*	Interpret expressions for functions in te	F.LE.5 (PR)	Interpret the parameters in a linear or exponential function in terms of a context.
Mathematics	HS	Trigonometric Functions	Extend the domain of trigonometric fun	F.TF.1 (PR)	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
Mathematics	HS	Congruence	Experiment with transformations in the	G.CO.1 (PR)	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
Mathematics	HS	Congruence	Experiment with transformations in the	G.CO.2 (PR)	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
Mathematics	HS	Congruence	Experiment with transformations in the	G.CO.5 (PR)	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
Mathematics	HS	Congruence	Understand congruence in terms of rigi	G.CO.6 (PR)	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.9 (PR)	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.10 (PR)	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
Mathematics	HS	Similarity, Right Triangles, and Trigonor	Understand similarity in terms of simila	G.SRT.2 (PR)	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
Mathematics	HS	Similarity, Right Triangles, and Trigonor	Prove theorems involving similarity.	G.SRT.5 (PR)	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
Mathematics	HS	Similarity, Right Triangles, and Trigonor	Define trigonometric ratios and solve pr	G.SRT.6 (PR)	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
Mathematics	HS	Similarity, Right Triangles, and Trigonor	Define trigonometric ratios and solve pr	G.SRT.8 (PR)	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.«
Mathematics	HS	Circles	Understand and apply theorems about	G.C.2 (PR)	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
Mathematics	HS	Expressing Geometric Properties with E	Translate between the geometric descr	G.GPE.1 (PR)	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
Mathematics	HS	Interpreting Categorical and Quantitativ	Summarize, represent, and interpret da	S.ID.1 (PR)	Represent data with plots on the real number line (dot plots, histograms, and box plots).
Mathematics	HS	Interpreting Categorical and Quantitativ	Summarize, represent, and interpret da	S.ID.2 (PR)	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
Mathematics	HS	Interpreting Categorical and Quantitativ	Summarize, represent, and interpret da	S.ID.3 (PR)	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
Mathematics	HS	Interpreting Categorical and Quantitativ	Summarize, represent, and interpret da	S.ID.6 (PR)	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
Mathematics	HS	Interpreting Categorical and Quantitativ	Summarize, represent, and interpret da	S.ID.6 a. (PR)	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.
Mathematics	HS	Interpreting Categorical and Quantitativ	Interpret linear models.	S.ID.7 (PR)	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
Mathematics	HS	Interpreting Categorical and Quantitativ	Interpret linear models.	S.ID.9 (PR)	Distinguish between correlation and causation.
Mathematics	HS	Making Inferences and Justifying Concl	Understand and evaluate random proc	S.IC.1 (PR)	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
Mathematics	HS	Making Inferences and Justifying Concl	Make inferences and justify conclusion	S.IC.3 (PR)	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard?	Algebra I	Geometry	Geometry Honors	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	The Real Number System	Extend the properties of exponents to rational exponents.	N.RN.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.	No	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐
Mathematics	HS	The Real Number System	Extend the properties of exponents to rational exponents.	N.RN.2 (PR)	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	The Real Number System	Use properties of rational and irrational numbers.	N.RN.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	No	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐
Mathematics	HS	Quantities*	Reason quantitatively and use units to solve problems.	N.Q.1 (PR)	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Priority	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Quantities*	Reason quantitatively and use units to solve problems.	N.Q.2 (PR)	Define appropriate quantities for the purpose of descriptive modeling.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Quantities*	Reason quantitatively and use units to solve problems.	N.Q.3 (PR)	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.1 (PR)	Know there is a complex number i such that i^2 = –1, and every complex number has the form a + bi with a and b real.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.2 (PR)	Use the relation i^2 = –1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	The Complex Number System	Perform arithmetic operations with complex numbers.	N.CN.3	(+) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	No	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐
Mathematics	HS	The Complex Number System	Represent complex numbers and their operations on the complex plane.	N.CN.4	(+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	The Complex Number System	Represent complex numbers and their operations on the complex plane.	N.CN.5	(+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, (-1 + 3i)^3 = 8 because (-1 + 3i) has modulus 2 and argument 120°.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑
Mathematics	HS	The Complex Number System	Represent complex numbers and their operations on the complex plane.	N.CN.6	(+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.7 (PR)	Solve quadratic equations with real coefficients that have complex solutions.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.8	(+) Extend polynomial identities to the complex numbers. For example, rewrite x^2 + 4 as (x + 2i)(x – 2i).	No	☐	☐	☐	☐	☐	☑	☐	☑	☑	☑
Mathematics	HS	The Complex Number System	Use complex numbers in polynomial identities and equations.	N.CN.9	(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	No	☐	☐	☐	☐	☐	☑	☐	☑	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.1	(+) Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, |v|, ||v||, v).	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.2	(+) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Represent and model with vector quantities.	N.VM.3	(+) Solve problems involving velocity and other quantities that can be represented by vectors.	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 (PR)	(+) Add and subtract vectors.	Priority	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 a. (PR)	Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.	Priority	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 b. (PR)	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.	Priority	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.4 c.	Understand vector subtraction v – w as v + (–w), where –w is the additive inverse of w, with the same magnitude as w and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5	(+) Multiply a vector by a scalar.	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5 a.	Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as c(vx, vy) = (cvx, cvy).	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Perform operations on vectors.	N.VM.5 b.	Compute the magnitude of a scalar multiple cv using ||cv|| = |c|v. Compute the direction of cv knowing that when |c|v ≠0, the direction of cv is either along v (for c > 0) or against v (for c < 0).	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.6	(+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.7	(+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.8	(+) Add, subtract, and multiply matrices of appropriate dimensions.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.9	(+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.10	(+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.11	(+) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Vector and Matrix Quantities	Perform operations on matrices and use matrices in applications.	N.VM.12	(+) Work with 2 × 2 matrices as a transformations of the plane, and interpret the absolute value of the determinant in terms of area.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

*Modeling is best interpreted not as a collection of isolated topics but in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.

(+) The high school standards specify the mathematics that all students should study in order to be college and career ready. Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics is indicated by (+). All standards without a (+) symbol should be in the common mathematics curriculum for all college and career ready students. Standards without a (+) symbol may also appear in courses intended for all students.

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard?	Algebra I	Geometry	Geometry Honors	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 (PR)	Interpret expressions that represent a quantity in terms of its context.★	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 a. (PR)	Interpret parts of an expression, such as terms, factors, and coefficients.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.1 b. (PR)	Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)n as the product of P and a factor not depending on P.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Seeing Structure in Expressions	Interpret the structure of expressions.	A.SSE.2 (PR)	Use the structure of an expression to identify ways to rewrite it. For example, see x4 – y4 as (x2)2 – (y2)2, thus recognizing it as a difference of squares that can be factored as (x2 – y2)(x2 + y2).	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 (PR)	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. ★	Priority	☑	☐	☐	☐	☑	☑	☐	☐	☐	☐
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 a. (PR)	Factor a quadratic expression to reveal the zeros of the function it defines.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 b. (PR)	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.3 c. (PR)	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	Priority	☐	☐	☐	☑	☑	☑	☐	☑	☑	☐
Mathematics	HS	Seeing Structure in Expressions	Write expressions in equivalent forms to solve problems.	A.SSE.4 (PR)	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.★	Priority	☐	☐	☐	☑	☑	☑	☑	☑	☑	☑
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Perform arithmetic operations on polynomials.	A.APR.1 (PR)	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).	No	☐	☐	☐	☑	☑	☑	☐	☑	☑	☑
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Understand the relationship between zeros and factors of polynomials.	A.APR.3 (PR)	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	Priority	☑	☐	☐	☑	☑	☑	☐	☑	☑	☑
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Use polynomial identities to solve problems.	A.APR.4	Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x2 + y2)2 = (x2 – y2)2 + (2xy)2 can be used to generate Pythagorean triples.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Use polynomial identities to solve problems.	A.APR.5	(+) Know and apply the Binomial Theorem for the expansion of (x + y)n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle. (The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.)	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Rewrite rational expressions.	A.APR.6	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.	No	☐	☐	☐	☐	☐	☑	☐	☑	☑	☑
Mathematics	HS	Arithmetic with Polynomials and Rational Expressions	Rewrite rational expressions.	A.APR.7	(+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	No	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.1 (PR)	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.2 (PR)	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.3 (PR)	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☑	☐
Mathematics	HS	Creating Equations*	Create equations that describe numbers or relationships	A.CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.	No	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.1 (PR)	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	Priority	☑	☐	☐	☑	☐	☐	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Understand solving equations as a process of reasoning and explain the reasoning.	A.REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	No	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.3 (PR)	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 (PR)	Solve quadratic equations in one variable.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 a.	Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p)^2 = q that has the same solutions. Derive the quadratic formula from this form.	No	☐	☐	☐	☐	☑	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve equations and inequalities in one variable.	A.REI.4 b.	Solve quadratic equations by inspection (e.g., for x^2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.	No	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.6 (PR)	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3 x and the circle x2 + y2 = 3.	No	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.8	(+) Represent a system of linear equations as a single matrix equation in a vector variable.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Solve systems of equations.	A.REI.9	(+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.10 (PR)	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard ?	Algebra I	Geometry	Geometry Honors	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.11 (PR)	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Reasoning with Equations and Inequalities	Represent and solve equations and inequalities graphically.	A.REI.12 (PR)	Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	Priority	☑	☐	☐	☐	☑	☑	☐	☐	☐	☐
*Modeling is best interpreted not as a collection of isolated topics but in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.																
(+) The high school standards specify the mathematics that all students should study in order to be college and career ready. Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics is indicated by (+). All standards without a (+) symbol should be in the common mathematics curriculum for all college and career ready students. Standards without a (+) symbol may also appear in courses intended for all students.																

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard?	Algebra I	Geometry	Geometry Hono	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	Interpreting Functions	Understand the concept of a function and use function notation.	F.IF.1 (PR)	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Understand the concept of a function and use function notation.	F.IF.2 (PR)	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Understand the concept of a function and use function notation.	F.IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ³ 1.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.4 (PR)	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.5 (PR)	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Interpret functions that arise in applications in terms of the context.	F.IF.6 (PR)	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 (PR)	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★	Priority	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 a. (PR)	Graph linear and quadratic functions and show intercepts, maxima, and minima.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 b.	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 c. (PR)	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 d. (PR)	(+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.	Priority	☐	☐	☐	☐	☐	☐	☑	☑	☑	☑
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.7 e. (PR)	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 (PR)	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 a. (PR)	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.8 b. (PR)	Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02)t, y = (0.97)t, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Functions	Analyze functions using different representations.	F.IF.9 (PR)	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 (PR)	Write a function that describes a relationship between two quantities.★	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 a.	Determine an explicit expression, a recursive process, or steps for calculation from a context.	No	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 b. (PR)	Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.1 c. (PR)	(+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.	Priority	☐	☐	☐	☐	☐	☑	☑	☑	☑	☑
Mathematics	HS	Building Functions	Build a function that models a relationship between two quantities.	F.BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★	No	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.3 (PR)	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	Priority	☑	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4	Find inverse functions.	No	☐	☐	☐	☐	☑	☑	☐	☑	☑	☑
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 a.	Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3 or f(x) = (x+1)/(x–1) for x ≠1.	No	☐	☐	☐	☑	☑	☑	☐	☑	☑	☑
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 b.	(+) Verify by composition that one function is the inverse of another.	No	☐	☐	☐	☐	☑	☑	☐	☑	☑	☑
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 c.	(+) Read values of an inverse function from a graph or a table, given that the function has an inverse.	No	☐	☐	☐	☐	☐	☑	☐	☑	☑	☑
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.4 d.	(+) Produce an invertible function from a non-invertible function by restricting the domain.	No	☐	☐	☐	☐	☐	☑	☐	☑	☑	☑
Mathematics	HS	Building Functions	Build new functions from existing functions.	F.BF.5	(+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	No	☐	☐	☐	☐	☐	☑	☐	☑	☑	☑
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 (PR)	Distinguish between situations that can be modeled with linear functions and with exponential functions.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 a. (PR)	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 b. (PR)	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.1 c. (PR)	Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.2 (PR)	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.3 (PR)	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Linear and Exponential Models*	Construct and compare linear and exponential models and solve problems.	F.LE.4	For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	No	☐	☐	☐	☐	☑	☑	☑	☑	☑	☐
Mathematics	HS	Linear and Exponential Models*	Interpret expressions for functions in terms of the situation they model.	F.LE.5 (PR)	Interpret the parameters in a linear or exponential function in terms of a context.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Trigonometric Functions	Extend the domain of trigonometric functions using the unit circle.	F.TF.1 (PR)	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard?	Algebra I	Geometry	Geometry Hono	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	Trigonometric Functions	Extend the domain of trigonometric functions using the unit circle.	F.TF.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Trigonometric Functions	Extend the domain of trigonometric functions using the unit circle.	F.TF.3	(+) Use special triangles to determine geometrically the values of sine, cosine, tangent for p/3, p/4 and p/6, and use the unit circle to express the values of sine, cosines, and tangent for x, p+x, and 2p–x in terms of their values for x, where x is any real number.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Trigonometric Functions	Extend the domain of trigonometric functions using the unit circle.	F.TF.4	(+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Trigonometric Functions	Model periodic phenomena with trigonometric functions.	F.TF.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.★	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Trigonometric Functions	Model periodic phenomena with trigonometric functions.	F.TF.6	(+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Trigonometric Functions	Model periodic phenomena with trigonometric functions.	F.TF.7	(+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.★	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Trigonometric Functions	Prove and apply trigonometric identities.	F.TF.8	Prove the Pythagorean identity sin2(θ) + cos2(θ) = 1 and use it to find sin(θ), cos(θ),or tan(θ) given sin(θ), cos(θ), or tan(θ) and the quadrant of the angle.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Trigonometric Functions	Prove and apply trigonometric identities.	F.TF.9	(+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
*Modeling is best interpreted not as a collection of isolated topics but in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (★). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.																
(+) The high school standards specify the mathematics that all students should study in order to be college and career ready. Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics is indicated by (+). All standards without a (+) symbol should be in the common mathematics curriculum for all college and career ready students. Standards without a (+) symbol may also appear in courses intended for all students.																

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard?	Algebra I	Geometry	Geometry Hono	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.1 (PR)	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.2 (PR)	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Experiment with transformations in the plane.	G.CO.5 (PR)	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.6 (PR)	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Understand congruence in terms of rigid motions.	G.CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.9 (PR)	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.10 (PR)	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Prove geometric theorems.	G.CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Make geometric constructions.	G.CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Congruence	Make geometric constructions.	G.CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.1	Verify experimentally the properties of dilations given by a center and a scale factor:	No	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.1 a.	A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.	No	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.1 b.	The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	No	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.2 (PR)	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Understand similarity in terms of similarity transformations.	G.SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Prove theorems involving similarity.	G.SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Prove theorems involving similarity.	G.SRT.5 (PR)	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.6 (PR)	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.	No	☐	☑	☑	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Define trigonometric ratios and solve problems involving right triangles.	G.SRT.8 (PR)	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.«	Priority	☐	☑	☑	☐	☐	☑	☑	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.9	(+) Derive the formula A = 1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.	No	☐	☑	☑	☐	☐	☑	☑	☑	☑	☑
Mathematics	HS	Similarity, Right Triangles, and Trigonometry	Apply trigonometry to general triangles.	G.SRT.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	No	☐	☑	☑	☐	☐	☑	☑	☑	☑	☑
Mathematics	HS	Circles	Understand and apply theorems about circles.	G.C.1	Prove that all circles are similar.	No	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Circles	Understand and apply theorems about circles.	G.C.2 (PR)	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.	Priority	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Circles	Understand and apply theorems about circles.	G.C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Circles	Understand and apply theorems about circles.	G.C.4	(+) Construct a tangent line from a point outside a given circle to the circle.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Circles	Find arc lengths and areas of sectors of circles.	G.C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Expressing Geometric Properties with Equations	Translate between the geometric description and the equation for a conic section.	G.GPE.1 (PR)	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	Priority	☐	☑	☑	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Expressing Geometric Properties with Equations	Translate between the geometric description and the equation for a conic section.	G.GPE.2	Derive the equation of a parabola given a focus and directrix.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Expressing Geometric Properties with Equations	Translate between the geometric description and the equation for a conic section.	G.GPE.3	(+)Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard?	Algebra I	Geometry	Geometry Hono	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, Ö3) lies on the circle centered at the origin and containing the point (0, 2).	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Expressing Geometric Properties with Equations	Use coordinates to prove simple geometric theorems algebraically.	G.GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Geometric Measurement and Dimension	Explain volume formulas and use them to solve problems.	G.GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Geometric Measurement and Dimension	Explain volume formulas and use them to solve problems.	G.GMD.2	(+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Geometric Measurement and Dimension	Explain volume formulas and use them to solve problems.	G.GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Geometric Measurement and Dimension	Visualize relationships between two-dimensional and three-dimensional objects.	G.GMD.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Modeling with Geometry	Apply geometric concepts in modeling situations.	G.MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).★	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Modeling with Geometry	Apply geometric concepts in modeling situations.	G.MG.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).★	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Modeling with Geometry	Apply geometric concepts in modeling situations.	G.MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).★	No	☐	☑	☑	☐	☐	☐	☐	☐	☐	☐
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(+) The high school standards specify the mathematics that all students should study in order to be college and career ready. Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics is indicated by (+). All standards without a (+) symbol should be in the common mathematics curriculum for all college and career ready students. Standards without a (+) symbol may also appear in courses intended for all students.																

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard?	Algebra I	Geometry	Geometry Honors	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.1 (PR)	Represent data with plots on the real number line (dot plots, histograms, and box plots).	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.2 (PR)	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.3 (PR)	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on a single count or measurement variable.	S.ID.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on two categorical and quantitative variables.	S.ID.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on two categorical and quantitative variables.	S.ID.6 (PR)	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on two categorical and quantitative variables.	S.ID.6 a. (PR)	Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on two categorical and quantitative variables.	S.ID.6 b.	Informally assess the fit of a function by plotting and analyzing residuals.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Summarize, represent, and interpret data on two categorical and quantitative variables.	S.ID.6 c.	Fit a linear function for a scatter plot that suggests a linear association.	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Interpret linear models.	S.ID.7 (PR)	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Priority	☑	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Interpret linear models.	S.ID.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Interpreting Categorical and Quantitative Data	Interpret linear models.	S.ID.9 (PR)	Distinguish between correlation and causation.	Priority	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Making Inferences and Justifying Conclusions	Understand and evaluate random processes underlying statistical experiments.	S.IC.1 (PR)	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Making Inferences and Justifying Conclusions	Understand and evaluate random processes underlying statistical experiments.	S.IC.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Making Inferences and Justifying Conclusions	Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	S.IC.3 (PR)	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	Priority	☐	☐	☐	☑	☑	☑	☐	☐	☐	☐
Mathematics	HS	Making Inferences and Justifying Conclusions	Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	S.IC.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Making Inferences and Justifying Conclusions	Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	S.IC.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Making Inferences and Justifying Conclusions	Make inferences and justify conclusions from sample surveys, experiments, and observational studies.	S.IC.6	Evaluate reports based on data.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Understand independence and conditional probability and use them to interpret data.	S.CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	No	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Understand independence and conditional probability and use them to interpret data.	S.CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Understand independence and conditional probability and use them to interpret data.	S.CP.3	Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Understand independence and conditional probability and use them to interpret data.	S.CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Understand independence and conditional probability and use them to interpret data.	S.CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Use the rules of probability to compute probabilities of compound events in a uniform probability model.	S.CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Use the rules of probability to compute probabilities of compound events in a uniform probability model.	S.CP.7	Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Use the rules of probability to compute probabilities of compound events in a uniform probability model.	S.CP.8	(+) Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Conditional Probability and the Rules of Probability	Use the rules of probability to compute probabilities of compound events in a uniform probability model.	S.CP.9	(+) Use permutations and combinations to compute probabilities of compound events and solve problems.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Using Probability to Make Decisions	Calculate expected values and use them to solve problems.	S.MD.1	(+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Using Probability to Make Decisions	Calculate expected values and use them to solve problems.	S.MD.2	(+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Using Probability to Make Decisions	Calculate expected values and use them to solve problems.	S.MD.3	(+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Priority Standard?	Algebra I	Geometry	Geometry Honors	A2	A2T	A2TH	TRT	PC	PCA	PCH
Mathematics	HS	Using Probability to Make Decisions	Calculate expected values and use them to solve problems.	S.MD.4	(+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Using Probability to Make Decisions	Use probability to evaluate outcomes of decisions.	S.MD.5	(+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Using Probability to Make Decisions	Use probability to evaluate outcomes of decisions.	S.MD.5 a.	Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast food restaurant.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Using Probability to Make Decisions	Use probability to evaluate outcomes of decisions.	S.MD.5 b.	Evaluate and compare strategies on the basis of expected values. For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Using Probability to Make Decisions	Use probability to evaluate outcomes of decisions.	S.MD.6	(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mathematics	HS	Using Probability to Make Decisions	Use probability to evaluate outcomes of decisions.	S.MD.7	(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	No	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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(+) The high school standards specify the mathematics that all students should study in order to be college and career ready. Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics is indicated by (+). All standards without a (+) symbol should be in the common mathematics curriculum for all college and career ready students. Standards without a (+) symbol may also appear in courses intended for all students.																

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Intro to Computer Science	AP Computer Science Principles	AP Computer Science A
Computer Science	9-10	Computing Systems	Devices	9-10.CS.01	Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects	☑	☑	☑
Computer Science	9-10	Computing Systems	Hardware and Software	9-10.CS.02	Compare levels of abstraction and interactions between application software, system software, and hardware layers.	☑	☐	☐
Computer Science	9-10	Computing Systems	Troubleshooting	9-10.CS.03	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.	☑	☑	☑
Computer Science	9-10	Networks and the Internet	Network Communication and Organization	9-10.NI.04	Evaluate the scalability and reliability of networks by describing the relationship between routers, switches, servers, topology, and addressing. attacks. 9-10.NI.06 Compare various security measures, considering tradeoffs between the usability and security of a computing system.	☐	☑	☐
Computer Science	9-10	Networks and the Internet	Network Communication and Organization	9-10.NI.05	Give examples to illustrate how sensitive data can be affected by malware and other attacks.	☑	☑	☐
Computer Science	9-10	Networks and the Internet	Network Communication and Organization	9-10.NI.06	Compare various security measures, considering tradeoffs between the usability and security of a computing system.	☑	☑	☐
Computer Science	9-10	Networks and the Internet	Cybersecurity	9-10.NI.07	Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.	☐	☑	☑
Computer Science	9-10	Networks and the Internet	Cybersecurity	9-10.NI.08	Explain tradeoffs when selecting and implementing cybersecurity recommendations.	☑	☐	☐
Computer Science	9-10	Data and Analysis	Storage	9-10.DA.09	Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.	☑	☑	☑
Computer Science	9-10	Data and Analysis	Storage	9-10.DA.10	Evaluate the tradeoffs in how data elements are organized and stored. Collection, Visualization, and Transformation	☑	☑	☑
Computer Science	9-10	Data and Analysis	Collection, Visualization, and Transformation	9-10.DA.11	Create interactive data visualizations using software tools to help others better understand real-world phenomena.	☑	☐	☐
Computer Science	9-10	Data and Analysis	Interference and Models	9-10.DA.12	Create computational models that represent the relationships among different elements of data collected from a phenomenon or process.	☐	☑	☑
Computer Science	9-10	Algorithms and Programming	Algorithms	9-10.AP.13	Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Variables	9-10.AP.14	Use lists to simplify solutions, generalizing computational problems instead of repeatedly using simple variables.	☐	☑	☑
Computer Science	9-10	Algorithms and Programming	Control	9-10.AP.15	Justify the selection of specific control structures when tradeoffs involve implementation, readability, and program performance, and explain the benefits and drawbacks of choices made.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Control	9-10.AP.16	Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Control	9-10.AP.17	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, or objects.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Modularity	9-10.AP.18	Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Modularity	9-10.AP.19	Systematically design and develop programs for broad audiences by incorporating feedback from users.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.20	Evaluate licenses that limit or restrict use of computational artifacts when using resources such as libraries.	☐	☑	☑
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.21	Evaluate and refine computational artifacts to make them more usable and accessible.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.22	Design and develop computational artifacts working in team roles using collaborative tools.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.23	Document design decisions using text, graphics, presentations, or demonstrations in the development of complex programs.	☑	☑	☑
Computer Science	9-10	Algorithms and Programming	Program Development	9-10.AP.24	Describe the characteristics and evaluate the impact of human computer interaction.	☑	☐	☐
Computer Science	9-10	Impacts of Computing	Culture	9-10.IC.25	Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices. Evaluate the ways digital social interactions impact personal, ethical, social, economic, and cultural practices.	☑	☑	☑
Computer Science	9-10	Impacts of Computing	Culture	9-10.IC.26	Test and refine computational artifacts to reduce bias and equity deficits.	☐	☑	☑
Computer Science	9-10	Impacts of Computing	Culture	9-10.IC.27	Demonstrate ways a given algorithm applies to problems across disciplines.	☐	☑	☑
Computer Science	9-10	Impacts of Computing	Social Interactions	9-10.IC.28	Use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.	☑	☑	☑
Computer Science	9-10	Impacts of Computing	Safety Law and Ethics	9-10.IC.29	Explain the beneficial and harmful effects that intellectual property laws can have on innovation.	☐	☑	☐
Computer Science	9-10	Impacts of Computing	Safety Law and Ethics	9-10.IC.30	Explain the privacy concerns related to the collection and generation of data through automated processes that may not be evident to users.	☑	☑	☑
Computer Science	9-10	Impacts of Computing	Safety Law and Ethics	9-10.IC.31	Evaluate the social and economic implications of privacy in the context of safety, law, or ethics.	☑	☑	☑
Computer Science	9-10	Emerging and Future Technologies	Emerging and Future Technologies	9-10.ET.A	Explain that the field of emerging technologies will be evolving and rapidly growing.	☐	☑	☐
Computer Science	9-10	Emerging and Future Technologies	Emerging and Future Technologies	9-10.ET.B	Compare existing and emerging technologies, ideas, and concepts.	☐	☑	☐
Computer Science	9-10	Emerging and Future Technologies	Emerging and Future Technologies	9-10.ET.C	Describe how emerging technologies are influencing current events at a local and global scale.	☐	☑	☑
Computer Science	9-10	Emerging and Future Technologies	Emerging and Future Technologies	9-10.ET.D	Predict the positive and negative societal, cultural, and economic impacts that emerging and future technologies may generate.	☐	☑	☑
Computer Science	9-10	Emerging and Future Technologies	Emerging and Future Technologies	9-10.ET.E	Create new or original work by applying emerging technologies.	☑	☑	☑
Computer Science	11-12	Computing Systems	Devices	11-12.CS.01	Compare the characteristics and uses of traditional and emerging computing devices and systems.	☑	☑	☑

Subject	Grade	Domain	Cluster Statement	Standard Code	Common Core Standard	Intro to Computer Science	AP Computer Science Principles	AP Computer Science A
Computer Science	11-12	Computing Systems	Hardware and Software	11-12.CS.02	Categorize the roles of operating system software.	☑	☐	☐
Computer Science	11-12	Computing Systems	Troubleshooting	11-12.CS.03	Illustrate ways computing systems implement logic, input, and output through hardware components.	☑	☐	☐
Computer Science	11-12	Networks and the Internet	Network Communication and Organization	11-12.NI.04	Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology).	☐	☑	☐
Computer Science	11-12	Networks and the Internet	Cybersecurity	11-12.NI.05	Compare ways software developers protect devices and information from unauthorized access.	☑	☐	☐
Computer Science	11-12	Data and Analysis	Collection, Visualization, and Transformation	11-12.DA.06	Use data analysis tools and techniques to identify patterns in data representing complex systems.	☑	☑	☑
Computer Science	11-12	Data and Analysis	Collection, Visualization, and Transformation	11-12.DA.07	Select data collection tools and techniques to generate data sets that support a claim or communicate information.	☑	☑	☑
Computer Science	11-12	Data and Analysis	Collection, Visualization, and Transformation	11-12.DA.08	Analyze the ways in which automated data collection is utilized in society.	☑	☑	☑
Computer Science	11-12	Data and Analysis	Interference and Models	11-12.DA.09	Evaluate the ability of models and simulations to test and support the refinement of hypotheses.	☑	☑	☑
Computer Science	11-12	Algorithms and Programming	Algorithms	11-12.AP.10	Describe how artificial intelligence drives many software and physical systems.	☐	☐	☑
Computer Science	11-12	Algorithms and Programming	Algorithms	11-12.AP.11	Implement an artificial intelligence algorithm to play a game against a human opponent or solve a problem.	☐	☐	☑
Computer Science	11-12	Algorithms and Programming	Algorithms	11-12.AP.12	Use and adapt classic algorithms to solve computational problems.	☐	☑	☑
Computer Science	11-12	Algorithms and Programming	Algorithms	11-12.AP.13	Evaluate algorithms in terms of their efficiency, correctness, and clarity.	☐	☐	☑
Computer Science	11-12	Algorithms and Programming	Variables	11-12.AP.14	Compare and contrast fundamental data structures and their uses.	☐	☐	☑
Computer Science	11-12	Algorithms and Programming	Control	11-12.AP.15	Illustrate the flow of execution of a recursive algorithm.	☐	☐	☑
Computer Science	11-12	Algorithms and Programming	Modularity	11-12.AP.16	Construct solutions to problems using student-created components, such as procedures, modules, or objects.	☑	☑	☑
Computer Science	11-12	Algorithms and Programming	Modularity	11-12.AP.17	Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution.	☐	☑	☑
Computer Science	11-12	Algorithms and Programming	Modularity	11-12.AP.18	Demonstrate code reuse by creating programming solutions using libraries and application programming interfaces.	☐	☑	☑
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.19	Plan and develop programs for broad audiences using a software life cycle process.	☑	☑	☑
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.20	Demonstrate conversion of source code into machine code using compliers or interpreters.	☐	☑	☑
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.21	Explain security issues that might lead to compromised computer programs.	☑	☐	☐
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.22	Develop programs for multiple computing platforms.	☑	☐	☑
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.23	Use version control systems, integrated development environments, and collaborative tools and practices (code documentation) in a group software project.	☐	☑	☑
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.24	Develop and use a series of test cases to verify that a program performs according to its design specifications.	☐	☐	☑
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.25	Discuss social, economic, and ethical consequences of malfunctional software and software updates.	☑	☐	☐
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.26	Modify an existing program to add additional functionality and discuss intended and unintended implications (e.g., breaking other functionality).	☐	☑	☑
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.27	Evaluate key qualities of a program through a process such as a code review.	☑	☑	☑
Computer Science	11-12	Algorithms and Programming	Program Development	11-12.AP.28	Compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.	☑	☐	☐
Computer Science	11-12	Impacts of Computing	Culture	11-12.IC.29	Evaluate computational artifacts to maximize their beneficial effects and minimize harmful effects on society.	☐	☑	☐
Computer Science	11-12	Impacts of Computing	Culture	11-12.IC.30	Evaluate the impact of equity, access, and influence on the distribution of computing resources in a global society.	☐	☑	☐
Computer Science	11-12	Impacts of Computing	Culture	11-12.IC.31	Predict how computational innovations that have revolutionized aspects of our culture might evolve.	☑	☑	☑
Computer Science	11-12	Impacts of Computing	Safety Law and Ethics	11-12.IC.32	Debate laws and regulations that impact the development and use of software.	☐	☑	☐
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.A	Explain that the field of emerging technologies will be evolving and rapidly growing.	☑	☑	☑
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.B	Compare existing and emerging technologies, ideas, and concepts.	☑	☐	☑
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.C	Describe how emerging technologies are influencing current events at a local and global scale.	☑	☐	☐
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.D	Predict the positive and negative societal, cultural, and economic impacts that emerging and future technologies may generate.	☐	☑	☐
Computer Science	11-12	Emerging and Future Technologies	Emerging and Future Technologies	11-12.ET.E	Create new or original work by applying emerging technologies.	☑	☑	☑