

- A2.N.1 Evaluate numerical expressions with negative and/or fractional exponents, without the aid of a calculator (when the answers are rational numbers)
- A2.N.2 Perform arithmetic operations (addition, subtraction, multiplication, division) with expressions containing irrational numbers in radical form
- A2.N.3 Perform arithmetic operations with polynomial expressions containing rational coefficients
- A2.N.4 Perform arithmetic operations on irrational expressions
- A2.N.5 Rationalize a denominator containing a radical expression
- A2.N.6 Write square roots of negative numbers in terms of i
- A2.N.7 Simplify powers of i
- A2.N.8 Determine the conjugate of a complex number
- A2.N.9 Perform arithmetic operations on complex numbers and write the answer in the form $a + bi$ *Note: This includes simplifying expressions with complex denominators.*
- A2.N.10 Know and apply sigma notation
- A2.A.1 Solve absolute value equations and inequalities involving linear expressions in one variable
- A2.A.2 Use the discriminant to determine the nature of the roots of a quadratic equation
- A2.A.3 Solve systems of equations involving one linear equation and one quadratic equation algebraically *Note: This includes rational equations that result in linear equations with extraneous roots.*
- A2.A.4 Solve quadratic inequalities in one and two variables, algebraically and graphically
- A2.A.5 Use direct and inverse variation to solve for unknown values
- A2.A.6 Solve an application which results in an exponential function
- A2.A.7 Factor polynomial expressions completely, using any combination of the following techniques: common factor extraction, difference of two perfect squares, quadratic trinomials
- A2.A.8 Apply the rules of exponents to simplify expressions involving negative and/or fractional exponents
- A2.A.9 Rewrite algebraic expressions that contain negative exponents using only positive exponents
- A2.A.10 Rewrite algebraic expressions with fractional exponents as radical expressions
- A2.A.11 Rewrite algebraic expressions in radical form as expressions with fractional exponents
- A2.A.12 Evaluate exponential expressions, including those with base e
- A2.A.13 Simplify radical expressions
- A2.A.14 Perform addition, subtraction, multiplication, and division of radical expressions
- A2.A.15 Rationalize denominators involving algebraic radical expressions
- A2.A.16 Perform arithmetic operations with rational expressions and rename to lowest terms
- A2.A.17 Simplify complex fractional expressions
- A2.A.18 Evaluate logarithmic expressions in any base
- A2.A.19 Apply the properties of logarithms to rewrite logarithmic expressions in equivalent forms
- A2.A.20 Determine the sum and product of the roots of a quadratic equation by examining its coefficients
- A2.A.21 Determine the quadratic equation, given the sum and product of its roots
- A2.A.22 Solve radical equations
- A2.A.23 Solve rational equations and inequalities
- A2.A.24 Know and apply the technique of completing the square
- A2.A.25 Solve quadratic equations, using the quadratic formula
- A2.A.26 Find the solution to polynomial equations of higher degree that can be solved using factoring and/or the quadratic formula
- A2.A.27 Solve exponential equations with and without common bases
- A2.A.28 Solve a logarithmic equation by rewriting as an exponential equation
- A2.A.29 Identify an arithmetic or geometric sequence and find the formula for its n th term
- A2.A.30 Determine the common difference in an arithmetic sequence
- A2.A.31 Determine the common ratio in a geometric sequence
- A2.A.32 Determine a specified term of an arithmetic or geometric sequence
- A2.A.33 Specify terms of a sequence, given its recursive definition
- A2.A.34 Represent the sum of a series, using sigma notation
- A2.A.35 Determine the sum of the first n terms of an arithmetic or geometric series
- A2.A.36 Apply the binomial theorem to expand a binomial and determine a specific term of a binomial expansion
- A2.A.37 Define a relation and function
- A2.A.38 Determine when a relation is a function
- A2.A.39 Determine the domain and range of a function from its equation
- A2.A.40 Write functions in functional notation
- A2.A.41 Use functional notation to evaluate functions for given values in the domain
- A2.A.42 Find the composition of functions
- A2.A.43 Determine if a function is one-to-one, onto, or both

- A2.A.44 Define the inverse of a function
- A2.A.45 Determine the inverse of a function and use composition to justify the result
- A2.A.46 Perform transformations with functions and relations: $f(x+a)$, $f(x)+a$, $f(-x)$, $-f(x)$, $af(x)$
- A2.A.47 Determine the center-radius form for the equation of a circle in standard form
- A2.A.48 Write the equation of a circle, given its center and a point on the circle
- A2.A.49 Write the equation of a circle from its graph
- A2.A.50 Approximate the solution to polynomial equations of higher degree by inspecting the graph
- A2.A.51 Determine the domain and range of a function from its graph
- A2.A.52 Identify relations and functions, using graphs
- A2.A.53 Graph exponential functions of the form $y = bx$ for positive values of b , including $b = e$
- A2.A.54 Graph logarithmic functions, using the inverse of the related exponential function
- A2.A.55 Express and apply the six trigonometric functions as ratios of the sides of a right triangle
- A2.A.56 Know the exact and approximate values of the sine, cosine, and tangent of 0° , 30° , 45° , 60° , 90° , 180° , and 270° angles
- A2.A.57 Sketch and use the reference angle for angles in standard position
- A2.A.58 Know and apply the co-function and reciprocal relationships between trigonometric ratios
- A2.A.59 Use the reciprocal and co-function relationships to find the value of the secant, cosecant, and cotangent of 0° , 30° , 45° , 60° , 90° , 180° , and 270° angles
- A2.A.60 Sketch the unit circle and represent angles in standard position
- A2.A.61 Determine the length of an arc of a circle, given its radius and the measure of its central angle
- A2.A.62 Find the value of trigonometric functions, if given a point on the terminal side of angle θ
- A2.A.63 Restrict the domain of the sine, cosine, and tangent functions to ensure the existence of an inverse function
- A2.A.64 Use inverse functions to find the measure of an angle, given its sine, cosine, or tangent
- A2.A.65 Sketch the graph of the inverses of the sine, cosine, and tangent functions
- A2.A.66 Determine the trigonometric functions of any angle, using technology
- A2.A.67 Justify the Pythagorean identities
- A2.A.68 Solve trigonometric equations for all values of the variable from 0° to 360°
- A2.A.69 Determine amplitude, period, frequency, and phase shift, given the graph or equation of a periodic function
- A2.A.70 Sketch and recognize one cycle of a function of the form $y = A\sin Bx$ or $y = A\cos Bx$
- A2.A.71 Sketch and recognize the graphs of the functions $y = \sec(x)$, $y = \csc(x)$, $y = \tan(x)$, and $y = \cot(x)$
- A2.A.72 Write the trigonometric function that is represented by a given periodic graph
- A2.A.73 Solve for an unknown side or angle, using the Law of Sines or the Law of Cosines
- A2.A.74 Determine the area of a triangle or a parallelogram, given the measure of two sides and the included angle
- A2.A.75 Determine the solution(s) from the SSA situation (ambiguous case)
- A2.A.76 Apply the angle sum and difference formulas for trigonometric functions
- A2.A.77 Apply the double-angle and half-angle formulas for trigonometric functions
- A2.M.1 Define radian measure
- A2.M.2 Convert between radian and degree measures
- A2.S.1 Understand the differences among various kinds of studies (e.g., survey, observation, controlled experiment)
- A2.S.2 Determine factors which may affect the outcome of a survey
- A2.S.3 Calculate measures of central tendency with group frequency distributions
- A2.S.4 Calculate measures of dispersion (range, quartiles, interquartile range, standard deviation, variance) for both samples and populations
- A2.S.5 Know and apply the characteristics of the normal distribution
- A2.S.6 Determine from a scatter plot whether a linear, logarithmic, exponential, or power regression model is most appropriate
- A2.S.7 Determine the function for the regression model, using appropriate technology, and use the regression function to interpolate and extrapolate from the data
- A2.S.8 Interpret within the linear regression model the value of the correlation coefficient as a measure of the strength of the relationship
- A2.S.9 Differentiate between situations requiring permutations and those requiring combinations
- A2.S.10 Calculate the number of possible permutations $({}_n P_r)$ of n items taken r at a time
- A2.S.11 Calculate the number of possible combinations $({}_n C_r)$ of n items taken r at a time
- A2.S.12 Use permutations, combinations, and the Fundamental Principle of Counting to determine the number of elements in a sample space and a specific subset (event)
- A2.S.13 Calculate theoretical probabilities, including geometric applications
- A2.S.14 Calculate empirical probabilities
- A2.S.15 Know and apply the binomial probability formula to events involving the terms *exactly*, *at least*, and *at most*
- A2.S.16 Use the normal distribution as an approximation for binomial probabilities