

Tennessee Tutorials are designed specifically for the Tennessee Academic Standards to prepare students for the Tennessee Comprehensive Assessment Program (TCAP) and the TNReady assessments.

Math Tutorials offer targeted instruction, practice and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. They automatically identify and address learning gaps down to elementary-level content, using adaptive remediation to bring students to grade-level no matter where they start. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing the ability to apply their knowledge in abstract and real world scenarios, students build the depth of knowledge and higher order skills required to demonstrate their mastery.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, modeled logic and process, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

Unit 1: Real Number System

• LAWS OF EXPONENTS

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.A.APR.C.4: Algebra Arithmetic with Polynomials and Rational Expressions Rewrite rational expressions. Rewrite rational expressions in different forms.
- A2.A.REI.A.1: Algebra Reasoning with Equations and Inequalities Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving an 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.
- A2.N.RN.A.1: Number and Quantity The Real Number System Extend the properties of exponents to rational exponents. 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.
- A2.N.RN.A.2: Number and Quantity The Real Number System Extend the properties of exponents to rational exponents. Rewrite expressions involving radicals and rational exponents using the

properties of exponents.

- **MONITORING PRECISION AND ACCURACY**

- A2.N.Q.A.1: Number and Quantity Quantities Reason quantitatively and use units to solve problems. Identify, interpret, and justify appropriate quantities for the purpose of descriptive modeling.

Unit 2: Equations and Inequalities

- **LITERAL EQUATIONS**

- A2.A.CED.A.1: Algebra Creating Equations Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems.
- A2.A.CED.A.2: Algebra Creating Equations Create equations that describe numbers or relationships. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

- **FORMULATING AND SOLVING EQUATIONS FROM WORD PROBLEMS**

- A2.A.CED.A.1: Algebra Creating Equations Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems.
- A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.
- A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.

- **FORMULATING AND SOLVING INEQUALITIES FROM WORD PROBLEMS**

- A2.A.CED.A.1: Algebra Creating Equations Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems.

Unit 3: Sequences

- **SEQUENCES**

- A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.
- A2.F.BF.A.2: Functions Building Functions Build a function that models a relationship between two quantities. Know and write arithmetic and geometric sequences with an explicit formula and use them to model situations.

- A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
- **ARITHMETIC AND GEOMETRIC SEQUENCES**
 - A2.F.BF.A.2: Functions Building Functions Build a function that models a relationship between two quantities. Know and write arithmetic and geometric sequences with an explicit formula and use them to model situations.
 - A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.
 - A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
- **SUMS OF GEOMETRIC SEQUENCES**
 - A2.A.SSE.B.3: Algebra Seeing Structure in Expressions Use expressions in equivalent forms to solve problems. Recognize a finite geometric series (when the common ratio is not 1), and know and use the sum formula to solve problems in context.
 - A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.
 - A2.F.BF.A.2: Functions Building Functions Build a function that models a relationship between two quantities. Know and write arithmetic and geometric sequences with an explicit formula and use them to model situations.

Unit 4: Linear Functions and Equations

- **GRAPHING AND ANALYZING LINEAR FUNCTIONS**
 - A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
 - A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- **GRAPHING AND MANIPULATING $Y = MX + B$**
 - A2.F.IF.A.2: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.

- A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.LE.B.3: Functions Linear, Quadratic, and Exponential Models Interpret expressions for functions in terms of the situation they model. Interpret the parameters in a linear or exponential function in terms of a context.

Unit 5: Exponential Functions

• EXPONENTIAL FUNCTIONS

- A2.A.SSE.B.2.a: Algebra Seeing Structure in Expressions Use expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Use the properties of exponents to rewrite expressions for exponential functions.
- A2.F.IF.B.4.a: Functions Interpreting Functions Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Know and use the properties of exponents to interpret expressions for exponential functions.
- A2.F.IF.A.2: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.IF.B.3.c: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph exponential and logarithmic functions, showing intercepts and end behavior.
- A2.A.CED.A.1: Algebra Creating Equations Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems.

- A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.
- A2.F.LE.B.3: Functions Linear, Quadratic, and Exponential Models Interpret expressions for functions in terms of the situation they model. Interpret the parameters in a linear or exponential function in terms of a context.
- **EXPONENTIAL GROWTH AND DECAY**
 - A2.F.IF.B.4.a: Functions Interpreting Functions Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Know and use the properties of exponents to interpret expressions for exponential functions.
 - A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
 - A2.F.LE.B.3: Functions Linear, Quadratic, and Exponential Models Interpret expressions for functions in terms of the situation they model. Interpret the parameters in a linear or exponential function in terms of a context.

Unit 6: Exponential Equations and Inequalities

- **SOLVING EXPONENTIAL EQUATIONS**
 - A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
 - A2.A.SSE.B.2.a: Algebra Seeing Structure in Expressions Use expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Use the properties of exponents to rewrite expressions for exponential functions.
 - A2.F.IF.B.4.a: Functions Interpreting Functions Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Know and use the properties of exponents to interpret expressions for exponential functions.
 - A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
 - A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.

- A2.F.IF.B.3.c: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph exponential and logarithmic functions, showing intercepts and end behavior.
- A2.F.LE.A.2: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. 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.
- **SOLVING EXPONENTIAL INEQUALITIES**
- A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
- A2.A.CED.A.1: Algebra Creating Equations Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems.

Unit 7: Logarithmic Expressions, Equations, and Functions

- **LOGARITHMIC FUNCTIONS**
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.BF.B.4.a: Functions Building Functions Build new functions from existing functions. Find inverse functions. Find the inverse of a function when the given function is one-to-one.
- A2.F.LE.A.2: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. 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.
- A2.F.IF.B.3.c: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph exponential and logarithmic functions, showing intercepts and end behavior.
- **EVALUATING LOGARITHMIC EXPRESSIONS**
- A2.F.LE.A.2: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. 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.
- **SOLVING LOGARITHMIC EQUATIONS**
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.

- A2.F.BF.B.4.a: Functions Building Functions Build new functions from existing functions. Find inverse functions. Find the inverse of a function when the given function is one-to-one.
- A2.F.LE.A.2: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. 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.
- A2.A.REI.A.1: Algebra Reasoning with Equations and Inequalities Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving an 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.

Unit 8: Arithmetic with Polynomials 1

- **POLYNOMIAL BASICS**

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.

- **ADDITION AND SUBTRACTION OF POLYNOMIALS**

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.

Unit 9: Arithmetic with Polynomials 2

- **MULTIPLICATION OF POLYNOMIALS**

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.

- **DIVISION OF POLYNOMIALS**

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.A.APR.C.4: Algebra Arithmetic with Polynomials and Rational Expressions Rewrite rational expressions. Rewrite rational expressions in different forms.

Unit 10: Representations of Quadratic Functions

- **ANALYZING GRAPHS OF QUADRATIC FUNCTIONS**

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.F.IF.B.5: Functions Interpreting Functions Analyze functions using different representations. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- A2.A.APR.A.2: Algebra Arithmetic with Polynomials and Rational Expressions Understand the relationship between zeros and factors of polynomials. 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.
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- **MULTIPLE REPRESENTATIONS OF FUNCTIONS**
 - A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
 - A2.F.IF.B.5: Functions Interpreting Functions Analyze functions using different representations. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
 - A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.

Unit 11: Solving Quadratic Equations 1

- **SOLVING QUADRATIC EQUATIONS BY FACTORING**
 - A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
 - A2.A.APR.A.2: Algebra Arithmetic with Polynomials and Rational Expressions Understand the relationship between zeros and factors of polynomials. 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.

- A2.A.APR.B.3: Algebra Arithmetic with Polynomials and Rational Expressions Use polynomial identities to solve problems. Know and use polynomial identities to describe numerical relationships.
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.
- **QUADRATIC FORMULA**
 - A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
 - A2.N.CN.B.3: Number and Quantity The Complex Number System Use complex numbers in quadratic equations. Solve quadratic equations with real coefficients that have complex solutions.
 - A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
 - A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .

- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.

Unit 12: Solving Quadratic Equations 2

• COMPLETING THE SQUARE

- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .

• COMPLEX NUMBERS AND QUADRATIC FUNCTIONS

- A2.N.CN.B.3: Number and Quantity The Complex Number System Use complex numbers in quadratic equations. Solve quadratic equations with real coefficients that have complex solutions.
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- A2.N.CN.A.1: Number and Quantity The Complex Number System Perform arithmetic operations with complex numbers. 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.
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- A2.N.CN.A.1: Number and Quantity The Complex Number System Perform arithmetic operations with complex numbers. 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.

- A2.N.CN.A.2: Number and Quantity The Complex Number System Perform arithmetic operations with complex numbers. Know and use the relation $i = \sqrt{-1}$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .

Unit 13: Factoring Polynomials

• FACTORING SPECIAL CASES

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.A.APR.A.2: Algebra Arithmetic with Polynomials and Rational Expressions Understand the relationship between zeros and factors of polynomials. 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.
- A2.A.APR.B.3: Algebra Arithmetic with Polynomials and Rational Expressions Use polynomial identities to solve problems. Know and use polynomial identities to describe numerical relationships.

• FACTORING CUBIC POLYNOMIALS

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.A.APR.B.3: Algebra Arithmetic with Polynomials and Rational Expressions Use polynomial identities to solve problems. Know and use polynomial identities to describe numerical relationships.
- A2.A.APR.A.2: Algebra Arithmetic with Polynomials and Rational Expressions Understand the relationship between zeros and factors of polynomials. 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.

Unit 14: Factoring Polynomials and the Factor Theorem

• FACTORING HIGHER-ORDER POLYNOMIALS

- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.A.APR.A.2: Algebra Arithmetic with Polynomials and Rational Expressions Understand the relationship between zeros and factors of polynomials. 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.

- A2.A.APR.B.3: Algebra Arithmetic with Polynomials and Rational Expressions Use polynomial identities to solve problems. Know and use polynomial identities to describe numerical relationships.
- **FACTOR THEOREM AND REMAINDER THEOREM**
- A2.A.APR.A.1: Algebra Arithmetic with Polynomials and Rational Expressions Understand the relationship between zeros and factors of polynomials. 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 $p(x)$.
- A2.A.APR.A.1: Algebra Arithmetic with Polynomials and Rational Expressions Understand the relationship between zeros and factors of polynomials. 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 $p(x)$.
- A2.A.APR.C.4: Algebra Arithmetic with Polynomials and Rational Expressions Rewrite rational expressions. Rewrite rational expressions in different forms.

Unit 15: Polynomial Functions and Complex Numbers

- **GRAPHS OF POLYNOMIAL FUNCTIONS**

- A2.A.APR.A.2: Algebra Arithmetic with Polynomials and Rational Expressions Understand the relationship between zeros and factors of polynomials. 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.
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.IF.B.3.b: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph polynomial functions, identifying zeros when suitable factorizations are available and showing end behavior.

- **COMPLEX NUMBERS**

- A2.N.CN.A.1: Number and Quantity The Complex Number System Perform arithmetic operations with complex numbers. 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.
- A2.N.CN.A.2: Number and Quantity The Complex Number System Perform arithmetic operations with complex numbers. Know and use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.

Unit 16: Polynomial Identities and Complex Numbers

- **POLYNOMIAL IDENTITIES**

- A2.A.APR.B.3: Algebra Arithmetic with Polynomials and Rational Expressions Use polynomial identities to solve problems. Know and use polynomial identities to describe numerical relationships.

- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .
- **POLYNOMIAL IDENTITIES AND COMPLEX NUMBERS**
 - A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
 - A2.A.APR.B.3: Algebra Arithmetic with Polynomials and Rational Expressions Use polynomial identities to solve problems. Know and use polynomial identities to describe numerical relationships.
 - A2.N.CN.A.1: Number and Quantity The Complex Number System Perform arithmetic operations with complex numbers. 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.
 - A2.N.CN.B.3: Number and Quantity The Complex Number System Use complex numbers in quadratic equations. Solve quadratic equations with real coefficients that have complex solutions.
 - A2.A.REI.B.3.a: Algebra Reasoning with Equations and Inequalities Solve equations and inequalities in one variable. Solve quadratic equations and inequalities in one variable. Solve quadratic equations by inspection (e.g., for $x = 49$), taking square roots, completing the square, knowing and applying 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 .

Unit 17: Radical Equations and Functions

- **ANALYZING GRAPHS OF SQUARE ROOT FUNCTIONS**
 - A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
 - A2.F.BF.B.3: Functions Building Functions Build new functions from existing functions. 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.
 - A2.F.IF.B.3.a: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using

technology. Graph square root, cube root, and piecewise defined functions, including step functions and absolute value functions.

- A2.F.BF.B.4.a: Functions Building Functions Build new functions from existing functions. Find inverse functions. Find the inverse of a function when the given function is one-to-one.
- **SOLVING SQUARE ROOT EQUATIONS**
- A2.A.REI.A.2: Algebra Reasoning with Equations and Inequalities Understand solving equations as a process of reasoning and explain the reasoning. Solve rational and radical equations in one variable, and identify extraneous solutions when they exist.
- A2.A.REI.A.1: Algebra Reasoning with Equations and Inequalities Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving an 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.
- A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.

Unit 18: Rational Expressions and Equations

- **OPERATIONS WITH RATIONAL EXPRESSIONS**
- A2.A.SSE.A.1: Algebra Seeing Structure in Expressions Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it.
- A2.A.APR.C.4: Algebra Arithmetic with Polynomials and Rational Expressions Rewrite rational expressions. Rewrite rational expressions in different forms.
- **SOLVING RATIONAL EQUATIONS**
- A2.A.REI.A.1: Algebra Reasoning with Equations and Inequalities Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving an 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.
- A2.A.REI.A.2: Algebra Reasoning with Equations and Inequalities Understand solving equations as a process of reasoning and explain the reasoning. Solve rational and radical equations in one variable, and identify extraneous solutions when they exist.

Unit 19: Representations of Rational Functions

- **ANALYZING GRAPHS OF RATIONAL FUNCTIONS**
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- **MODELING SITUATIONS WITH RATIONAL FUNCTIONS**

- A2.A.REI.A.2: Algebra Reasoning with Equations and Inequalities Understand solving equations as a process of reasoning and explain the reasoning. Solve rational and radical equations in one variable, and identify extraneous solutions when they exist.
- A2.F.BF.A.1.a: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context.

Unit 20: Functions

• INVERSE FUNCTIONS

- A2.F.BF.B.4.a: Functions Building Functions Build new functions from existing functions. Find inverse functions. Find the inverse of a function when the given function is one-to-one.

• LINEAR VERSUS NONLINEAR FUNCTIONS

- A2.F.IF.A.2: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.

• ARITHMETIC OPERATIONS ON FUNCTIONS

- A2.F.BF.A.1.b: Functions Building Functions Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. Combine standard function types using arithmetic operations.

Unit 21: Trigonometric Functions

• RADIANS AND THE UNIT CIRCLE

- A2.F.TF.A.1.a: Functions Trigonometric Functions Extend the domain of trigonometric functions using the unit circle. Understand and use radian measure of an angle. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
- A2.F.TF.A.2: Functions Trigonometric Functions Extend the domain of trigonometric functions using the unit circle. 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.
- A2.F.TF.A.1.b: Functions Trigonometric Functions Extend the domain of trigonometric functions using the unit circle. Understand and use radian measure of an angle. Use the unit circle to find \sin , \cos , and \tan when θ is a commonly recognized angle between 0 and 2π .

- A2.F.TF.B.3.a: Functions Trigonometric Functions Prove and apply trigonometric identities. Know and use trigonometric identities to find values of trig functions. Given a point on a circle centered at the origin, recognize and use the right triangle ratio definitions of \sin , \cos , and \tan to evaluate the trigonometric functions.
- A2.F.TF.B.3.a: Functions Trigonometric Functions Prove and apply trigonometric identities. Know and use trigonometric identities to find values of trig functions. Given a point on a circle centered at the origin, recognize and use the right triangle ratio definitions of \sin , \cos , and \tan to evaluate the trigonometric functions.
- **TRIGONOMETRIC FUNCTIONS**
- A2.F.TF.A.1.b: Functions Trigonometric Functions Extend the domain of trigonometric functions using the unit circle. Understand and use radian measure of an angle. Use the unit circle to find \sin , \cos , and \tan when is a commonly recognized angle between 0 and 2.
- A2.F.TF.B.3.a: Functions Trigonometric Functions Prove and apply trigonometric identities. Know and use trigonometric identities to find values of trig functions. Given a point on a circle centered at the origin, recognize and use the right triangle ratio definitions of \sin , \cos , and \tan to evaluate the trigonometric functions.
- A2.F.TF.B.3.b: Functions Trigonometric Functions Prove and apply trigonometric identities. Know and use trigonometric identities to find values of trig functions. Given the quadrant of the angle, use the identity $\sin^2 + \cos^2 = 1$ to find \sin given \cos , or vice versa.

Unit 22: Parent Functions and Transformations

- **PARENT FUNCTIONS**
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.IF.B.3.a: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph square root, cube root, and piecewise defined functions, including step functions and absolute value functions.
- A2.F.BF.B.3: Functions Building Functions Build new functions from existing functions. 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.
- A2.F.IF.B.3.b: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph polynomial functions, identifying zeros when suitable factorizations are available and showing end behavior.
- A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions,

including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.

- A2.F.IF.B.3.c: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph exponential and logarithmic functions, showing intercepts and end behavior.

- **TRANSFORMATIONS OF PARENT FUNCTIONS**

- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.IF.B.3.a: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph square root, cube root, and piecewise defined functions, including step functions and absolute value functions.
- A2.F.BF.B.3: Functions Building Functions Build new functions from existing functions. 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.
- A2.F.IF.B.3.b: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph polynomial functions, identifying zeros when suitable factorizations are available and showing end behavior.
- A2.F.IF.B.3.c: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph exponential and logarithmic functions, showing intercepts and end behavior.

- **MULTIPLE TRANSFORMATIONS OF PARENT FUNCTIONS**

- A2.F.BF.B.3: Functions Building Functions Build new functions from existing functions. 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.
- A2.F.IF.A.1: Functions Interpreting Functions Interpret functions that arise in applications in terms of the context. 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.
- A2.F.IF.B.3.a: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph square root, cube root, and piecewise defined functions, including step functions and absolute value functions.

- A2.F.IF.B.3.b: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph polynomial functions, identifying zeros when suitable factorizations are available and showing end behavior.
- A2.F.IF.B.3.c: Functions Interpreting Functions Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Graph exponential and logarithmic functions, showing intercepts and end behavior.

Unit 23: Systems of Equations

- **SOLVING THREE-VARIABLE SYSTEMS OF LINEAR EQUATIONS**

- A2.A.REI.C.4: Algebra Reasoning with Equations and Inequalities Solve systems of equations. Write and solve a system of linear equations in context.

- **SYSTEMS OF NONLINEAR EQUATIONS**

- A2.A.REI.C.5: Algebra Reasoning with Equations and Inequalities Solve systems of equations. Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
- A2.A.REI.D.6: Algebra Reasoning with Equations and Inequalities Represent and solve equations graphically. 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 approximate solutions using technology.
- A2.F.LE.A.1: Functions Linear, Quadratic, and Exponential Models Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.

Unit 24: Statistical Design and Analysis

- **ANALYZING STATISTICAL SAMPLES**

- A2.S.IC.A.2: Statistics and Probability Making Inferences and Justifying Conclusions Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Use data from a sample survey to estimate a population mean or proportion; use a given margin of error to solve a problem in context.

- **EXPERIMENTAL AND OBSERVATIONAL DESIGN**

- A2.S.IC.A.1: Statistics and Probability Making Inferences and Justifying Conclusions Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

- **NORMAL DISTRIBUTION**

- A2.S.ID.A.1: Statistics and Probability Interpreting Categorical and Quantitative Data Summarize, represent, and interpret data on a single count or measurement variable. Use the mean and standard

deviation of a data set to fit it to a normal distribution and to estimate population percentages using the Empirical Rule.

- A2.S.IC.A.2: Statistics and Probability Making Inferences and Justifying Conclusions Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Use data from a sample survey to estimate a population mean or proportion; use a given margin of error to solve a problem in context.

Unit 25: Probability

• INTRODUCTION TO PROBABILITY

- A2.S.CP.A.1: Statistics and Probability Conditional Probability and the Rules of Probability Understand independence and conditional probability and use them to interpret data. 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).
- A2.S.CP.A.2: Statistics and Probability Conditional Probability and the Rules of Probability Understand independence and conditional probability and use them to interpret data. 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.
- A2.S.CP.A.4: Statistics and Probability Conditional Probability and the Rules of Probability Understand independence and conditional probability and use them to interpret data. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
- A2.S.CP.B.6: Statistics and Probability Conditional Probability and the Rules of Probability Use the rules of probability to compute probabilities of compound events in a uniform probability model. Know and apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.

• GEOMETRIC PROBABILITIES

- A2.S.CP.A.1: Statistics and Probability Conditional Probability and the Rules of Probability Understand independence and conditional probability and use them to interpret data. 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).
- A2.S.CP.B.6: Statistics and Probability Conditional Probability and the Rules of Probability Use the rules of probability to compute probabilities of compound events in a uniform probability model. Know and apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.
- A2.S.CP.A.1: Statistics and Probability Conditional Probability and the Rules of Probability Understand independence and conditional probability and use them to interpret data. 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).
- A2.S.CP.B.6: Statistics and Probability Conditional Probability and the Rules of Probability Use the rules of probability to compute probabilities of compound events in a uniform probability model. Know and

apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.

- **CONDITIONAL PROBABILITY**

- A2.S.CP.A.3: Statistics and Probability Conditional Probability and the Rules of Probability Understand independence and conditional probability and use them to interpret data. Know and understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, 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.
- A2.S.CP.A.4: Statistics and Probability Conditional Probability and the Rules of Probability Understand independence and conditional probability and use them to interpret data. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
- A2.S.CP.B.5: Statistics and Probability Conditional Probability and the Rules of Probability Use the rules of probability to compute probabilities of compound events in a uniform probability model. Find the conditional probability of A given B as the fraction of Bs outcomes that also belong to A and interpret the answer in terms of the model.
- A2.S.CP.A.2: Statistics and Probability Conditional Probability and the Rules of Probability Understand independence and conditional probability and use them to interpret data. 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.
- A2.S.CP.B.5: Statistics and Probability Conditional Probability and the Rules of Probability Use the rules of probability to compute probabilities of compound events in a uniform probability model. Find the conditional probability of A given B as the fraction of Bs outcomes that also belong to A and interpret the answer in terms of the model.
- A2.S.CP.B.5: Statistics and Probability Conditional Probability and the Rules of Probability Use the rules of probability to compute probabilities of compound events in a uniform probability model. Find the conditional probability of A given B as the fraction of Bs outcomes that also belong to A and interpret the answer in terms of the model.
- A2.S.CP.B.5: Statistics and Probability Conditional Probability and the Rules of Probability Use the rules of probability to compute probabilities of compound events in a uniform probability model. Find the conditional probability of A given B as the fraction of Bs outcomes that also belong to A and interpret the answer in terms of the model.
- A2.S.CP.B.5: Statistics and Probability Conditional Probability and the Rules of Probability Use the rules of probability to compute probabilities of compound events in a uniform probability model. Find the conditional probability of A given B as the fraction of Bs outcomes that also belong to A and interpret the answer in terms of the model.