MCAP EOC Tutorials for Maryland are designed specifically for the Maryland College and Career Ready Standards to prepare students for the Maryland Comprehensive Assessment Program (MCAP). EOC Categories are at the heart of MCAP EOC Tutorial structure – bringing category-based learning to the student experience, and category-based performance and progress tracking to the teacher experience.

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 when put to the test.

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.

Test-Taking Strategies for EOC Tutorials allow students to practice and apply learning approaches that will hone their test-taking skills and focus them for success on the day of their EOC test.

1. REAL NUMBER SYSTEM 1

- **LAWS OF EXPONENTS**
  - **A.SSE.B.3c** *Use the properties of exponents to transform expressions for exponential functions.*

- **MONITORING PRECISION AND ACCURACY**
  - **N.Q.A.1** *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.*
  - **A.REI.B.3** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
  - **N.Q.A.3** *Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*

2. REAL NUMBER SYSTEM 2

- **OPERATIONS ON RATIONAL AND IRRATIONAL NUMBERS**
  - **N.RN.B.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.*
  - **A1.R.4** *Identify an option that would refute a conjecture/claim.*
  - **A1.R.9** *Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures about functions.*
  - **A1.M.7** *Identify information or assumptions needed to solve a problem.*

3. EQUATIONS AND INEQUALITIES 1

- **ONE-STEP EQUATIONS AND INEQUALITIES**
  - **A.CED.A.1** *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.*
  - **A.REI.B.3** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*

- **A1.R.1** *Given an equation reason about the number and/or nature of the solutions.*
- **A.CED.A.3** *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.*

4. EQUATIONS AND INEQUALITIES 2

- **MULTI-STEP EQUATIONS AND INEQUALITIES**
  - **A.CED.A.1** *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.*
  - **A1.M.6** *Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.*
  - **A.REI.B.3** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
  - **A1.R.1** *Given an equation reason about the number and/or nature of the solutions.*
  - **A.REI.A.1** *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.*
  - **A.CED.A.3** *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.*

5. LITERAL EQUATIONS

- **LITERAL EQUATIONS**
  - **A.REI.B.3** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
  - **A.CED.A.4** *Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.*
  - **A1.M.7** *Identify information or assumptions needed to solve a problem.*

6. ALGEBRAIC EXPRESSIONS

- **AXIOMS OF EQUALITY**
  - **A.SSE.A.2** *Use the structure of expressions to identify ways to rewrite it.*
  - **A1.M.6** *Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.*

- **FORMULATING AND SIMPLIFYING ALGEBRAIC EXPRESSIONS**
  - **A.SSE.A.1a** *Interpret parts of an expression, such as terms, factors, and coefficients.*

7. WRITING EXPRESSIONS AND EQUATIONS

- **FORMULATING AND SOLVING EQUATIONS FROM WORD PROBLEMS**
  - **A.SSE.A.1a** *Interpret parts of an expression, such as terms, factors, and coefficients.*
  - **A.CED.A.1** *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.*
  - **A.REI.B.3** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
  - **A1.R.1** *Given an equation reason about the number and/or nature of the solutions.*
  - **A.CED.A.3** *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.*

- **FORMULATING AND SOLVING INEQUALITIES FROM WORD PROBLEMS**
  - **A.SSE.A.1a** *Interpret parts of an expression, such as terms, factors, and coefficients.*
  - **A.CED.A.1** *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.*
  - **A1.R.8** *Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any).*

- **A.REI.B.3** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
- **A.CED.A.3** *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.*

8. FUNCTIONS 1

- **FUNCTIONS AND RELATIONS**
  - **F.IF.A.2** *Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a real-world context.*
  - **F.IF.A.1** *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 $y = f(x)$.*
  - **F.IF.C.7b** *Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.*
  - **F.BF.A.1a** *Determine an explicit expression, a recursive process, or steps for calculation from a real-world context.*

- **DOMAIN AND RANGE**
  - **F.IF.A.1** *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 $y = f(x)$.*
  - **F.IF.B.5** *Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes.*
  - **F.IF.C.7b** *Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.*

9. FUNCTIONS 2

- **EVALUATING FUNCTIONS**
  - **F.IF.A.2** *Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a real-world context.*
  - **F.LE.A.2** *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).*
  - **A1.R.1** *Given an equation reason about the number and/or nature of the solutions.*

10. INTRODUCTION TO LINEAR RELATIONSHIPS

- **SLOPE**
  - **F.IF.B.4** *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.*
  - **F.LE.B.5** *Interpret the parameters in a linear or exponential function in terms of a context.*
  - **A1.R.11** *Express reasoning about linear and exponential growth.*
  - **F.IF.B.6** *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.*

- **GRAPHING AND ANALYZING LINEAR FUNCTIONS**
  - **F.LE.A.2** *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).*
  - **F.IF.B.5** *Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes.*
  - **A.REI.D.10** *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).*
  - **F.LE.B.5** *Interpret the parameters in a linear or exponential function in terms of a context.*
  - **F.IF.B.4** *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.*
  - **F.IF.C.7a** *Graph linear and quadratic functions and show intercepts, maxima and minima.*

- **GRAPHS OF LINEAR INEQUALITIES**
  - **A.REI.D.12** *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.*
  - **A.CED.A.3** *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.*
  - **A1.R.3** *Reasoning based on the principle that the graph of an equation and inequality in two variables is the set of all its solutions plotted in the coordinate plane.*

11. LINEAR EQUATIONS

- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**
  - **F.LE.B.5** *Interpret the parameters in a linear or exponential function in terms of a context.*
  - **A.CED.A.2** *Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*
  - **A.REI.D.10** *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).*

- **POINT-SLOPE FORM OF A LINEAR EQUATION**
  - **A.CED.A.2** *Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*

- **GRAPHING AND MANIPULATING Y = MX + B**
  - **F.BF.B.3** *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.*
  - **F.IF.B.4** *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.*
  - **S.ID.C.7** *Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the real-world context of the data.*
  - **F.LE.B.5** *Interpret the parameters in a linear or exponential function in terms of a context.*

12. INTRODUCTION TO TWO-VARIABLE LINEAR SYSTEMS 1

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: GUESS AND CHECK**
  - **A1.R.8** *Given an equation or system of equations, present the solution steps as a logical argument that concludes with the set of solutions (if any).*
  - **A.CED.A.3** *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.*
  - **F.BF.A.1a** *Determine an explicit expression, a recursive process, or steps for calculation from a real-world context.*
  - **A.REI.C.6** *Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.*
  - **A1.R.2** *Given a system of equations reason about the number or nature of the solutions.*

13. INTRODUCTION TO TWO-VARIABLE LINEAR SYSTEMS 2

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: GRAPHING**
  - **A.CED.A.3** *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.*
  - **A.REI.C.6** *Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.*
  - **A1.R.2** *Given a system of equations reason about the number or nature of the solutions.*

14. SOLVING TWO-VARIABLE LINEAR SYSTEMS

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: SUBSTITUTION**
  - **A.CED.A.3** *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.*
  - **A.REI.C.6** *Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.*
  - **A1.M.6** *Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.*
  - **A1.R.2** *Given a system of equations reason about the number or nature of the solutions.*

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: ELIMINATION**
  - **A.CED.A.3** *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.*
  - **A.REI.C.6** *Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.*
  - **A1.M.6** *Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.*
  - **A1.R.2** *Given a system of equations reason about the number or nature of the solutions.*

- **SOLVING SYSTEMS OF LINEAR INEQUALITIES**
  - **A.CED.A.3** *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.*
  - **A.REI.D.12** *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.*
  - **A1.M.6** *Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.*
  - **A.REI.C.6** *Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.*
  - **A1.R.3** *Reasoning based on the principle that the graph of an equation and inequality in two variables is the set of all its solutions plotted in the coordinate plane.*

15. EXPONENTIAL FUNCTIONS AND INEQUALITIES

- **EXPONENTIAL FUNCTIONS**
  - **F.IF.B.4** *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.*
  - **F.LE.A.1c** *Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.*
  - **F.LE.B.5** *Interpret the parameters in a linear or exponential function in terms of a context.*
  - **A1.R.11** *Express reasoning about linear and exponential growth.*
  - **F.IF.B.5** *Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes.*
  - **F.LE.A.2** *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).*

- **EXPONENTIAL GROWTH AND DECAY**
  - **A.SSE.A.1a** *Interpret parts of an expression, such as terms, factors, and coefficients.*
  - **A.SSE.B.3c** *Use the properties of exponents to transform expressions for exponential functions.*
  - **A1.R.11** *Express reasoning about linear and exponential growth.*
  - **F.LE.A.1c** *Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.*
  - **F.LE.A.1a** *Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.*

- **SOLVING EXPONENTIAL INEQUALITIES**
  - **A1.R.11** *Express reasoning about linear and exponential growth.*
  - **F.LE.A.2** *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).*
  - **F.LE.B.5** *Interpret the parameters in a linear or exponential function in terms of a context.*

16. SEQUENCES

- **SEQUENCES**
  - **F.IF.A.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 $n \geq 1$.*
  - **F.BF.A.1a** *Determine an explicit expression, a recursive process, or steps for calculation from a real-world context.*
  - **F.LE.A.1a** *Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.*

- **ARITHMETIC AND GEOMETRIC SEQUENCES**
  - **F.BF.A.1a** *Determine an explicit expression, a recursive process, or steps for calculation from a real-world context.*
  - **F.IF.A.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 $n \geq 1$.*
  - **F.LE.A.2** *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).*

17. POLYNOMIALS

- **POLYNOMIAL BASICS**

- **ADDITION AND SUBTRACTION OF POLYNOMIALS**
  - **A.APR.A.1** *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.*

- **MULTIPLICATION OF POLYNOMIALS**
  - **A.APR.A.1** *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.*

18. FACTORING POLYNOMIALS

- **FACTORING QUADRATIC TRINOMIALS**
  - **A.SSE.B.3a** *Factor a quadratic expression to reveal the zeros of the function it defines.*
  - **F.IF.C.8a** *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 real-world context.*
  - **A.SSE.A.2** *Use the structure of expressions to identify ways to rewrite it.*

- **FACTORING SPECIAL CASES**
  - **A.SSE.A.2** *Use the structure of expressions to identify ways to rewrite it.*
  - **A.SSE.B.3a** *Factor a quadratic expression to reveal the zeros of the function it defines.*

- **FACTORING HIGHER-ORDER POLYNOMIALS**
  - **A.APR.B.3** *Identify zeros of polynomials when suitable factorizations are available and/or use the zeros to construct a rough graph of the function defined by the polynomial.*

19. INTRODUCTION TO QUADRATIC FUNCTIONS 1

- **QUADRATIC FUNCTIONS**

- **F.IF.C.8a** *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 real-world context.*
- **F.IF.C.7a** *Graph linear and quadratic functions and show intercepts, maxima and minima.*

- **COMPLETING THE SQUARE**
  - **A.REI.B.4b** *Solve quadratic equations with rational number coefficients 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.*
  - **A.REI.B.4a** *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.*
  - **F.IF.C.8a** *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 real-world context.*
  - **A.SSE.B.3b** *Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.*

20. INTRODUCTION TO QUADRATIC FUNCTIONS 2

- **REPRESENTATIONS OF QUADRATIC FUNCTIONS**
  - **A.REI.B.4b** *Solve quadratic equations with rational number coefficients 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.*
  - **A1.M.6** *Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.*
  - **A.CED.A.1** *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.*

21. SOLVING QUADRATIC FUNCTIONS

- **SOLVING QUADRATIC EQUATIONS BY FACTORING**
  - **A1.M.6** *Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.*
  - **A.REI.B.4b** *Solve quadratic equations with rational number coefficients 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.*
  - **A.SSE.B.3a** *Factor a quadratic expression to reveal the zeros of the function it defines.*
  - **F.IF.C.7a** *Graph linear and quadratic functions and show intercepts, maxima and minima.*
  - **F.IF.C.8a** *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 real-world context.*
  - **A1.R.1** *Given an equation reason about the number and/or nature of the solutions.*
  - **A.CED.A.3** *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.*

- **QUADRATIC FORMULA**
  - **A1.M.6** *Solve multi-step contextual word problems with degree of difficulty appropriate to the course, requiring application of course-level knowledge and skills articulated in the standards.*
  - **A.REI.B.4b** *Solve quadratic equations with rational number coefficients 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.*
  - **A1.R.1** *Given an equation reason about the number and/or nature of the solutions.*
  - **A.CED.A.3** *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.*

22. NONLINEAR FUNCTIONS

- **ANALYZING GRAPHS OF QUADRATIC FUNCTIONS**

- **F.IF.B.5** *Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes.*
- **F.BF.B.3** *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.*
- **A.CED.A.3** *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.*
- **F.IF.C.7a** *Graph linear and quadratic functions and show intercepts, maxima and minima.*
- **F.IF.B.4** *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.*
- **A.APR.B.3** *Identify zeros of polynomials when suitable factorizations are available and/or use the zeros to construct a rough graph of the function defined by the polynomial.*
- **F.IF.C.9** *Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).*

- **SYSTEMS OF NONLINEAR EQUATIONS**
  - **A1.R.2** *Given a system of equations reason about the number or nature of the solutions.*

23. PARENT FUNCTIONS

- **LINEAR AND EXPONENTIAL PARENT FUNCTIONS**
  - **F.LE.A.2** *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).*
  - **A.REI.D.10** *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).*
  - **F.IF.B.5** *Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes.*
  - **F.LE.B.5** *Interpret the parameters in a linear or exponential function in terms of a context.*
  - **F.IF.B.4** *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.*
  - **F.LE.A.1a** *Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.*

- **QUADRATIC PARENT FUNCTION**
  - **F.IF.B.5** *Relate the domain of a function to a graph and, where applicable, to the quantitative relationship it describes.*

24. TRANSFORMATIONS OF PARENT FUNCTIONS

- **TRANSFORMATIONS OF THE LINEAR AND EXPONENTIAL PARENT FUNCTIONS**
  - **A1.R.10** *Express reasoning about transformations of functions.*
  - **F.BF.B.3** *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.*

- **TRANSFORMATIONS OF THE QUADRATIC PARENT FUNCTION**
  - **A1.R.10** *Express reasoning about transformations of functions.*
  - **F.BF.B.3** *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.*

25. WORKING WITH FUNCTIONS

- **LINEAR VERSUS NONLINEAR FUNCTIONS**

- **F.LE.A.1a** *Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.*
- **F.LE.A.1b** *Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.*
- **F.IF.B.6** *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.*
- **A.REI.D.10** *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).*

- **ABSOLUTE VALUE FUNCTIONS**
  - **A.REI.D.10** *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).*
  - **F.IF.C.7b** *Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.*
  - **F.IF.B.4** *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.*

- **MULTIPLE REPRESENTATIONS OF FUNCTIONS**
  - **F.IF.C.9** *Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).*

26. STATISTICS

- **DATA ANALYSIS**

- **FREQUENCY TABLES**

27. TWO-VARIABLE DATA

- **SCATTERPLOTS**
  - **S.ID.B.6** *Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.*
  - **S.ID.C.9** *Distinguish between correlation and causation.*
  - **S.ID.C.7** *Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the real-world context of the data.*

- **SCATTERPLOTS AND MODELING**
  - **S.ID.B.6a** *Fit a function to the data; use functions fitted to data to solve problems in the real-world context of the data. Use given functions or choose a function suggested by the real-world context. Emphasize linear, quadratic, and exponential models.*
  - **S.ID.B.6b** *Informally assess the fit of a function by plotting and analyzing residuals.*
  - **S.ID.C.8** *Compute (using technology) and interpret the correlation coefficient of a linear fit.*

28. TEST-TAKING STRATEGIES

- **STUDY HABITS**

- **BEING PREPARED AND GETTING STARTED**

- **WORDING IN TEST QUESTIONS**

- **WORDING IN ANSWER CHOICES**

- **QUESTIONS WITH PASSAGES AND VISUAL DATA**

- **ESSAY AND SHORT ANSWER QUESTIONS**

- **WORD PROBLEMS**