NCEOC Tutorials for North Carolina are designed specifically for the North Carolina Standard Course of Study, to prepare students for the North Carolina End of Course exam (NCEOC). EOC Categories are at the heart of NCEOC 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. SOLVING EQUATIONS

- **ONE-STEP EQUATIONS AND INEQUALITIES**
  - **NC.M1.A-CED.1** *Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.*
  - **NC.M1.A-REI.1** *Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.*
  - **NC.M1.A-REI.3** *Solve linear equations and inequalities in one variable.*

- **MULTI-STEP EQUATIONS AND INEQUALITIES**
  - **NC.M1.A-CED.1** *Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.*
  - **NC.M1.A-REI.1** *Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.*
  - **NC.M1.A-REI.3** *Solve linear equations and inequalities in one variable.*

- **AXIOMS OF EQUALITY**
  - **NC.M1.A-CED.4** *Solve for a quantity of interest in formulas used in science and mathematics using the same reasoning as in solving equations.*
  - **NC.M1.A-REI.1** *Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.*

- **LITERAL EQUATIONS**
  - **NC.M1.A-CED.4** *Solve for a quantity of interest in formulas used in science and mathematics using the same reasoning as in solving equations.*

2. WRITING AND SIMPLIFYING EXPRESSIONS AND EQUATIONS

- **FORMULATING AND SIMPLIFYING ALGEBRAIC EXPRESSIONS**
  - **NC.M1.A-SSE.1a** *Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.*
  - **NC.M1.A-SSE.1b** *Interpret a linear, exponential, or quadratic expression made of multiple parts as a combination of entities to give meaning to an expression.*

- **FORMULATING AND SOLVING EQUATIONS FROM WORD PROBLEMS**
  - **NC.M1.A-CED.1** *Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.*
  - **NC.M1.A-REI.3** *Solve linear equations and inequalities in one variable.*
  - **NC.M1.A-REI.1** *Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.*

- **FORMULATING AND SOLVING INEQUALITIES FROM WORD PROBLEMS**
  - **NC.M1.A-CED.1** *Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.*
  - **NC.M1.A-REI.3** *Solve linear equations and inequalities in one variable.*

- **LAWS OF EXPONENTS**
  - **NC.M1.N-RN.2** *Rewrite algebraic expressions with integer exponents using the properties of exponents.*

3. FUNCTIONS

- **FUNCTIONS AND RELATIONS**
  - **NC.M1.F-IF.1** *Build an understanding 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 by recognizing that: 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).*
  - **NC.M1.F-IF.2** *Use function notation to evaluate linear, quadratic, and exponential functions for inputs in their domains, and interpret statements that use function notation in terms of a context.*
  - **NC.M1.F-IF.5** *Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.*

- **DOMAIN AND RANGE**
  - **NC.M1.F-IF.5** *Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.*
  - **NC.M1.F-IF.2** *Use function notation to evaluate linear, quadratic, and exponential functions for inputs in their domains, and interpret statements that use function notation in terms of a context.*
  - **NC.M1.F-IF.1** *Build an understanding 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 by recognizing that: 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).*

- **EVALUATING FUNCTIONS**
  - **NC.M1.F-IF.2** *Use function notation to evaluate linear, quadratic, and exponential functions for inputs in their domains, and interpret statements that use function notation in terms of a context.*
  - **NC.M1.F-IF.5** *Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.*

4. SLOPES OF LINEAR EQUATIONS

- **SLOPE**

- **NC.M1.F-IF.4** *Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.*
- **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
- **NC.M1.G-GPE.5** *Use coordinates to prove the slope criteria for parallel and perpendicular lines and use them to solve problems. Determine if two lines are parallel, perpendicular, or neither. Find the equation of a line parallel or perpendicular to a given line that passes through a given point.*

PARALLEL AND PERPENDICULAR LINES

- **NC.M1.G-GPE.5** *Use coordinates to prove the slope criteria for parallel and perpendicular lines and use them to solve problems. Determine if two lines are parallel, perpendicular, or neither. Find the equation of a line parallel or perpendicular to a given line that passes through a given point.*

5. GRAPHING LINEAR EQUATIONS

GRAPHING AND ANALYZING LINEAR FUNCTIONS

- **NC.M1.A-CED.2** *Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.*
- **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
- **NC.M1.F-BF.1a** *Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).*
- **NC.M1.F-IF.5** *Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.*
- **NC.M1.F-LE.5** *Interpret the parameters a and b in a linear function $f(x) = ax + b$ or an exponential function $g(x) = ab^x$ in terms of a context.*
- **NC.M1.F-IF.4** *Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.*
- **NC.M1.A-REI.10** *Understand that the graph of a two variable equation represents the set of all solutions to the equation.*
- **NC.M1.F-LE.1** *Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.*

GRAPHING AND MANIPULATING Y = MX + B

- **NC.M1.A-CED.2** *Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.*
- **NC.M1.F-IF.4** *Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.*
- **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
- **NC.M1.F-LE.5** *Interpret the parameters a and b in a linear function $f(x) = ax + b$ or an exponential function $g(x) = ab^x$ in terms of a context.*
- **NC.M1.A-REI.10** *Understand that the graph of a two variable equation represents the set of all solutions to the equation.*
- **NC.M1.F-LE.1** *Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.*

6. LINEAR EQUATIONS

SLOPE-INTERCEPT FORM OF A LINEAR EQUATION

- **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
- **NC.M1.F-BF.1a** *Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).*
- **NC.M1.G-GPE.5** *Use coordinates to prove the slope criteria for parallel and perpendicular lines and use them to solve problems. Determine if two lines are parallel, perpendicular, or neither. Find the equation of a line parallel or perpendicular to a given line that passes through a given point.*

POINT-SLOPE FORM OF A LINEAR EQUATION

- **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
- **NC.M1.F-BF.1a** *Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).*
- **NC.M1.G-GPE.5** *Use coordinates to prove the slope criteria for parallel and perpendicular lines and use them to solve problems. Determine if two lines are parallel, perpendicular, or neither. Find the equation of a line parallel or perpendicular to a given line that passes through a given point.*

7. SYSTEMS OF LINEAR EQUATIONS

SOLVING SYSTEMS OF LINEAR EQUATIONS: GRAPHING

- **NC.M1.A-CED.3** *Create systems of linear equations and inequalities to model situations in context.*
- **NC.M1.A-REI.6** *Use tables, graphs, or algebraic methods (substitution and elimination) to find approximate or exact solutions to systems of linear equations and interpret solutions in terms of a context.*
- **NC.M1.A-REI.11** *Build an understanding of why the x-coordinates of the points where the graphs of two linear, exponential, and/or quadratic equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ and approximate solutions using graphing technology or successive approximations with a table of values.*
- **NC.M1.A-REI.10** *Understand that the graph of a two variable equation represents the set of all solutions to the equation.*

SOLVING SYSTEMS OF LINEAR EQUATIONS: SUBSTITUTION

- **NC.M1.A-CED.3** *Create systems of linear equations and inequalities to model situations in context.*
- **NC.M1.A-REI.6** *Use tables, graphs, or algebraic methods (substitution and elimination) to find approximate or exact solutions to systems of linear equations and interpret solutions in terms of a context.*

SOLVING SYSTEMS OF LINEAR EQUATIONS: ELIMINATION

- **NC.M1.A-CED.3** *Create systems of linear equations and inequalities to model situations in context.*
- **NC.M1.A-REI.5** *Explain why replacing one equation in a system of linear equations by the sum of that equation and a multiple of the other produces a system with the same solutions.*
- **NC.M1.A-REI.6** *Use tables, graphs, or algebraic methods (substitution and elimination) to find approximate or exact solutions to systems of linear equations and interpret solutions in terms of a context.*

8. LINEAR INEQUALITIES

GRAPHS OF LINEAR INEQUALITIES

- **NC.M1.A-REI.12** *Represent the solutions of a linear inequality or a system of linear inequalities graphically as a region of the plane.*

SOLVING SYSTEMS OF LINEAR INEQUALITIES

- **NC.M1.A-CED.3** *Create systems of linear equations and inequalities to model situations in context.*
- **NC.M1.A-REI.12** *Represent the solutions of a linear inequality or a system of linear inequalities graphically as a region of the plane.*

9. EXPONENTIAL FUNCTIONS

- **EXPONENTIAL FUNCTIONS**
  - **NC.M1.A-SSE.1a** *Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.*
  - **NC.M1.A-SSE.1b** *Interpret a linear, exponential, or quadratic expression made of multiple parts as a combination of entities to give meaning to an expression.*
  - **NC.M1.F-IF.2** *Use function notation to evaluate linear, quadratic, and exponential functions for inputs in their domains, and interpret statements that use function notation in terms of a context.*
  - **NC.M1.F-IF.4** *Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.*
  - **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
  - **NC.M1.A-REI.10** *Understand that the graph of a two variable equation represents the set of all solutions to the equation.*
  - **NC.M1.F-IF.8b** *Interpret and explain growth and decay rates for an exponential function.*
  - **NC.M1.F-LE.5** *Interpret the parameters a and b in a linear function $f(x) = ax + b$ or an exponential function $g(x) = ab^x$ in terms of a context.*
  - **NC.M1.F-IF.5** *Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.*
  - **NC.M1.A-CED.2** *Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.*
  - **NC.M1.F-BF.1a** *Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).*
  - **NC.M1.F-LE.1** *Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.*

- **EXPONENTIAL GROWTH AND DECAY**
  - **NC.M1.A-SSE.1a** *Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.*
  - **NC.M1.A-SSE.1b** *Interpret a linear, exponential, or quadratic expression made of multiple parts as a combination of entities to give meaning to an expression.*
  - **NC.M1.F-IF.4** *Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.*
  - **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
  - **NC.M1.F-IF.8b** *Interpret and explain growth and decay rates for an exponential function.*
  - **NC.M1.F-LE.5** *Interpret the parameters a and b in a linear function $f(x) = ax + b$ or an exponential function $g(x) = ab^x$ in terms of a context.*
  - **NC.M1.A-REI.10** *Understand that the graph of a two variable equation represents the set of all solutions to the equation.*
  - **NC.M1.F-LE.1** *Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.*
  - **NC.M1.A-CED.1** *Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.*
  - **NC.M1.A-CED.2** *Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.*
  - **NC.M1.F-BF.1a** *Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).*

- **SOLVING EXPONENTIAL INEQUALITIES**
  - **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple*

cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.

- **NC.M1.A-CED.1** *Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.*

10. SEQUENCES

- **SEQUENCES**
  - **NC.M1.F-BF.1a** *Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).*
  - **NC.M1.F-IF.3** *Recognize that recursively and explicitly defined sequences are functions whose domain is a subset of the integers, the terms of an arithmetic sequence are a subset of the range of a linear function, and the terms of a geometric sequence are a subset of the range of an exponential function.*
  - **NC.M1.F-LE.1** *Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.*

- **ARITHMETIC AND GEOMETRIC SEQUENCES**
  - **NC.M1.F-IF.3** *Recognize that recursively and explicitly defined sequences are functions whose domain is a subset of the integers, the terms of an arithmetic sequence are a subset of the range of a linear function, and the terms of a geometric sequence are a subset of the range of an exponential function.*
  - **NC.M1.F-BF.1a** *Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).*
  - **NC.M1.F-BF.2** *Translate between explicit and recursive forms of arithmetic and geometric sequences and use both to model situations.*
  - **NC.M1.F-LE.1** *Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.*

11. ARITHMETIC WITH POLYNOMIALS

- **POLYNOMIAL BASICS**
  - **NC.M1.A-APR.1** *Build an understanding that operations with polynomials are comparable to operations with integers by adding and subtracting quadratic expressions and by adding, subtracting, and multiplying linear expressions.*

- **ADDITION AND SUBTRACTION OF POLYNOMIALS**
  - **NC.M1.A-APR.1** *Build an understanding that operations with polynomials are comparable to operations with integers by adding and subtracting quadratic expressions and by adding, subtracting, and multiplying linear expressions.*

- **MULTIPLICATION OF POLYNOMIALS**
  - **NC.M1.A-APR.1** *Build an understanding that operations with polynomials are comparable to operations with integers by adding and subtracting quadratic expressions and by adding, subtracting, and multiplying linear expressions.*

12. FACTORING

- **FACTORING QUADRATIC TRINOMIALS**
  - **NC.M1.A-SSE.3** *Write an equivalent form of a quadratic expression-$ax^2 + bx + c$, where a is an integer, by factoring to reveal the solutions of the equation or the zeros of the function the expression defines.*

- **FACTORING SPECIAL CASES**
  - **NC.M1.A-SSE.3** *Write an equivalent form of a quadratic expression-$ax^2 + bx + c$, where a is an integer, by factoring to reveal the solutions of the equation or the zeros of the function the expression defines.*

13. QUADRATIC EQUATIONS AND FUNCTIONS

- **QUADRATIC FUNCTIONS**
  - **NC.M1.A-SSE.1a** *Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.*
  - **NC.M1.A-SSE.1b** *Interpret a linear, exponential, or quadratic expression made of multiple parts as a combination of entities to give meaning to an expression.*
  - **NC.M1.F-IF.8a** *Rewrite a quadratic function to reveal and explain different key features of the function.*
  - **NC.M1.A-APR.3** *Understand the relationships among the factors of a quadratic expression, the solutions of a quadratic equation, and the zeros of a quadratic function.*
  - **NC.M1.F-IF.4** *Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.*
  - **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
  - **NC.M1.A-CED.2** *Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.*
  - **NC.M1.A-REI.10** *Understand that the graph of a two variable equation represents the set of all solutions to the equation.*

- **REPRESENTATIONS OF QUADRATIC FUNCTIONS**
  - **NC.M1.A-CED.2** *Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.*
  - **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
  - **NC.M1.F-IF.8a** *Rewrite a quadratic function to reveal and explain different key features of the function.*
  - **NC.M1.A-APR.3** *Understand the relationships among the factors of a quadratic expression, the solutions of a quadratic equation, and the zeros of a quadratic function.*
  - **NC.M1.F-IF.4** *Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.*
  - **NC.M1.A-REI.10** *Understand that the graph of a two variable equation represents the set of all solutions to the equation.*
  - **NC.M1.A-SSE.1a** *Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.*
  - **NC.M1.A-SSE.1b** *Interpret a linear, exponential, or quadratic expression made of multiple parts as a combination of entities to give meaning to an expression.*

- **ANALYZING GRAPHS OF QUADRATIC FUNCTIONS**
  - **NC.M1.F-IF.5** *Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.*
  - **NC.M1.F-IF.7** *Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.*
  - **NC.M1.A-APR.3** *Understand the relationships among the factors of a quadratic expression, the solutions of a quadratic equation, and the zeros of a quadratic function.*
  - **NC.M1.F-IF.4** *Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.*
  - **NC.M1.F-IF.8a** *Rewrite a quadratic function to reveal and explain different key features of the function.*

14. QUADRATIC EQUATIONS

- **SOLVING EQUATIONS USING ROOTS**
  - **NC.M1.A-CED.1** *Create equations and inequalities in one variable that represent linear, exponential, and quadratic*

relationships and use them to solve problems.

- **NC.M1.A-REI.4** *Solve for the real solutions of quadratic equations in one variable by taking square roots and factoring.*

- **SOLVING QUADRATIC EQUATIONS BY FACTORING**
  - **NC.M1.A-SSE.1a** *Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.*
  - **NC.M1.A-SSE.1b** *Interpret a linear, exponential, or quadratic expression made of multiple parts as a combination of entities to give meaning to an expression.*
  - **NC.M1.A-SSE.3** *Write an equivalent form of a quadratic expression-* $ax^2 + bx + c$*, where a is an integer, by factoring to reveal the solutions of the equation or the zeros of the function the expression defines.*
  - **NC.M1.A-CED.1** *Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.*
  - **NC.M1.A-REI.1** *Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.*
  - **NC.M1.A-REI.4** *Solve for the real solutions of quadratic equations in one variable by taking square roots and factoring.*
  - **NC.M1.A-APR.3** *Understand the relationships among the factors of a quadratic expression, the solutions of a quadratic equation, and the zeros of a quadratic function.*

- **SYSTEMS OF NONLINEAR EQUATIONS**
  - **NC.M1.A-REI.11** *Build an understanding of why the x-coordinates of the points where the graphs of two linear, exponential, and/or quadratic equations* $y = f(x)$ *and* $y = g(x)$ *intersect are the solutions of the equation* $f(x) = g(x)$ *and approximate solutions using graphing technology or successive approximations with a table of values.*

15. WORKING WITH FUNCTIONS

- **LINEAR VERSUS NONLINEAR FUNCTIONS**
  - **NC.M1.F-LE.5** *Interpret the parameters* a *and* b *in a linear function* $f(x) = ax + b$ *or an exponential function* $g(x) = ab^x$ *in terms of a context.*
  - **NC.M1.F-LE.3** *Compare the end behavior of linear, exponential, and quadratic functions using graphs and tables to show that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically.*
  - **NC.M1.F-LE.1** *Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.*
  - **NC.M1.F-IF.6** *Calculate and interpret the average rate of change over a specified interval for a function presented numerically, graphically, and/or symbolically.*

- **MULTIPLE REPRESENTATIONS OF FUNCTIONS**
  - **NC.M1.F-IF.9** *Compare key features of two functions (linear, quadratic, or exponential) each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions).*
  - **NC.M1.F-BF.1a** *Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).*
  - **NC.M1.F-LE.5** *Interpret the parameters* a *and* b *in a linear function* $f(x) = ax + b$ *or an exponential function* $g(x) = ab^x$ *in terms of a context.*
  - **NC.M1.F-LE.1** *Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.*
  - **NC.M1.F-LE.3** *Compare the end behavior of linear, exponential, and quadratic functions using graphs and tables to show that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically.*

- **ARITHMETIC OPERATIONS ON FUNCTIONS**
  - **NC.M1.F-BF.1b** *Build a function that models a relationship between two quantities by combining linear, exponential, or quadratic functions with addition and subtraction or two linear functions with multiplication.*

16. COORDINATE GEOMETRY

- **PERIMETER ON THE COORDINATE PLANE**

- **NC.M1.G-GPE.4** *Use coordinates to solve geometric problems involving polygons algebraically. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles. Use coordinates to verify algebraically that a given set of points produces a particular type of triangle or quadrilateral.*

- **AREA ON THE COORDINATE PLANE**
  - **NC.M1.G-GPE.4** *Use coordinates to solve geometric problems involving polygons algebraically. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles. Use coordinates to verify algebraically that a given set of points produces a particular type of triangle or quadrilateral.*

- **MIDPOINT FORMULA ON THE COORDINATE PLANE**
  - **NC.M1.G-GPE.6** *Use coordinates to find the midpoint or endpoint of a line segment.*

- **CONJECTURES IN COORDINATE GEOMETRY**

17. STATISTICS

- **DATA ANALYSIS**
  - **NC.M1.S-ID.1** *Use technology to represent data with plots on the real number line (histograms, and box plots).*
  - **NC.M1.S-ID.2** *Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. Interpret differences in shape, center, and spread in the context of the data sets.*
  - **NC.M1.S-ID.3** *Examine the effects of extreme data points (outliers) on shape, center, and/or spread.*

- **SCATTERPLOTS**
  - **NC.M1.S-ID.8** *Analyze patterns and describe relationships between two variables in context. Using technology, determine the correlation coefficient of bivariate data and interpret it as a measure of the strength and direction of a linear relationship. Use a scatter plot, correlation coefficient, and a residual plot to determine the appropriateness of using a linear function to model a relationship between two variables.*
  - **NC.M1.S-ID.9** *Distinguish between association and causation.*

- **SCATTERPLOTS AND MODELING**
  - **NC.M1.S-ID.7** *Interpret in context the rate of change and the intercept of a linear model. Use the linear model to interpolate and extrapolate predicted values. Assess the validity of a predicted value.*
  - **NC.M1.S-ID.6a** *Fit a least squares regression line to linear data using technology. Use the fitted function to solve problems.*
  - **NC.M1.S-ID.6b** *Assess the fit of a linear function by analyzing residuals.*
  - **NC.M1.S-ID.8** *Analyze patterns and describe relationships between two variables in context. Using technology, determine the correlation coefficient of bivariate data and interpret it as a measure of the strength and direction of a linear relationship. Use a scatter plot, correlation coefficient, and a residual plot to determine the appropriateness of using a linear function to model a relationship between two variables.*

- **QUADRATIC AND EXPONENTIAL MODELS**
  - **NC.M1.S-ID.6c** *Fit a function to exponential data using technology. Use the fitted function to solve problems.*

18. 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**

- ESSAY AND SHORT ANSWER QUESTIONS
- WORD PROBLEMS