

SOL EOC Tutorials for Virginia are designed specifically for the Virginia Standards of Learning to prepare students for the Standards of Learning tests (SOL). EOC Categories are at the heart of SOL 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. QUADRATIC FUNCTIONS

● ANALYZING GRAPHS OF QUADRATIC FUNCTIONS

- **F.AII.7.f** values of a function for elements in its domain;
- **F.AII.7.a** domain, range, and continuity;
- **F.AII.7.b** intervals in which a function is increasing or decreasing;
- **F.AII.7.h** end behavior;
- **F.AII.7.e** intercepts;
- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.
- **F.AII.7.g** connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs;

● REPRESENTATIONS OF QUADRATIC FUNCTIONS

- **F.AII.7.g** connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs;
- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.
- **F.AII.7.a** domain, range, and continuity;
- **F.AII.7.k** composition of functions algebraically and graphically.

2. SOLVING QUADRATIC EQUATIONS

● SOLVING QUADRATIC FUNCTIONS BY FACTORING

- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.
- **F.AII.7.g** connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs;

- **COMPLETING THE SQUARE**

- **F.AII.7.g** connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs;
- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.

- **QUADRATIC FORMULA**

- **F.AII.7.g** connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs;
- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.

3. COMPLEX NUMBERS

- **COMPLEX NUMBERS**

- **EO.AII.2** The student will perform operations on complex numbers and express the results in simplest form using patterns of the powers of i .

4. COMPLEX NUMBERS AND QUADRATIC FUNCTIONS

- **COMPLEX NUMBERS AND QUADRATIC FUNCTIONS**

- **EI.AII.3.b** quadratic equations over the set of complex numbers;

5. EXPONENTIAL FUNCTIONS

- **EXPONENTIAL FUNCTIONS**

- **F.AII.7.a** domain, range, and continuity;
- **F.AII.7.b** intervals in which a function is increasing or decreasing;

- **SOLVING EXPONENTIAL EQUATIONS**

- **F.AII.7.a** domain, range, and continuity;
- **F.AII.7.d** zeros;
- **F.AII.7.e** intercepts;
- **F.AII.7.i** vertical and horizontal asymptotes;
- **F.AII.7.k** composition of functions algebraically and graphically.
- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.

6. LOGARITHMIC EXPRESSIONS, EQUATIONS, AND FUNCTIONS

- **LOGARITHMIC FUNCTIONS**

- **F.AII.7.j** inverse of a function; and

- **SOLVING LOGARITHMIC EQUATIONS**

- **F.AII.7.d** zeros;
- **F.AII.7.e** intercepts;
- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.

7. SEQUENCES

- **ARITHMETIC AND GEOMETRIC SEQUENCES**

- **F.AII.5** The student will investigate and apply the properties of arithmetic and geometric sequences and series to solve practical problems, including writing the first n terms, determining the n th term, and evaluating summation formulas. Notation will include Σ and a_n .

- **SUMS OF GEOMETRIC SEQUENCES**

- **F.AII.5** The student will investigate and apply the properties of arithmetic and geometric sequences and series to solve practical problems, including writing the first n terms, determining the n th term, and evaluating summation formulas. Notation will include Σ and a_n .

8. FACTORING POLYNOMIALS

- **FACTORING SPECIAL CASES**

- **EO.AII.1.c** factor polynomials completely in one or two variables.

- **FACTORING CUBIC POLYNOMIALS**

- **EO.AII.1.c** factor polynomials completely in one or two variables.

- **FACTORING HIGHER-ORDER POLYNOMIALS**

- **EO.AII.1.c** factor polynomials completely in one or two variables.

9. GRAPHS OF POLYNOMIAL FUNCTIONS

- **GRAPHS OF POLYNOMIAL FUNCTIONS**

- **F.AII.7.a** domain, range, and continuity;
- **F.AII.7.c** extrema;
- **F.AII.7.d** zeros;
- **F.AII.7.e** intercepts;
- **F.AII.7.f** values of a function for elements in its domain;
- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x -intercepts of a graph, and factors of a polynomial expression.
- **F.AII.7.h** end behavior;
- **F.AII.7.b** intervals in which a function is increasing or decreasing;

10. EXPONENTS

- **LAWS OF EXPONENTS**

- **EI.AII.3.d** equations containing radical expressions.

11. RADICAL AND RATIONAL EXPRESSIONS

- **ADVANCED PROPERTIES OF SQUARE ROOT EXPRESSIONS**

- **EO.AII.1.b** add, subtract, multiply, divide, and simplify radical expressions containing rational numbers and variables, and expressions containing rational exponents; and

- **OPERATIONS WITH RATIONAL EXPRESSIONS**

- **EO.AII.1.a** add, subtract, multiply, divide, and simplify rational algebraic expressions;

12. SOLVING RADICAL EQUATIONS

- **SOLVING SQUARE ROOT EQUATIONS**

- **EI.AII.3.d** equations containing radical expressions.

13. SOLVING RATIONAL EQUATIONS

• SOLVING RATIONAL EQUATIONS

- **EI.AII.3.c** equations containing rational algebraic expressions; and
- **F.AII.7.d** zeros;

14. RADICAL AND RATIONAL FUNCTIONS

• ANALYZING GRAPHS OF SQUARE ROOT FUNCTIONS

- **F.AII.7.j** inverse of a function; and
- **F.AII.7.a** domain, range, and continuity;

• ANALYZING GRAPHS OF RATIONAL FUNCTIONS

- **F.AII.7.d** zeros;
- **F.AII.8** The student will investigate and describe the relationships among solutions of an equation, zeros of a function, x-intercepts of a graph, and factors of a polynomial expression.
- **F.AII.7.i** vertical and horizontal asymptotes;
- **F.AII.7.g** connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs;
- **F.AII.7.a** domain, range, and continuity;
- **F.AII.7.f** values of a function for elements in its domain;

• MODELING SITUATIONS WITH RATIONAL FUNCTIONS

- **F.AII.7.e** intercepts;
- **F.AII.7.i** vertical and horizontal asymptotes;

15. NONLINEAR FUNCTIONS AND EQUATIONS

• ABSOLUTE VALUE FUNCTIONS

- **EI.AII.3.a** absolute value linear equations and inequalities;

• SYSTEMS OF NONLINEAR EQUATIONS

- **EI.AII.4** The student will solve systems of linear-quadratic and quadratic-quadratic equations, algebraically and graphically.

16. DIRECT AND INVERSE VARIATION

• INVERSE VARIATION

- **S.AII.10** The student will represent and solve problems, including practical problems, involving inverse variation, joint variation, and a combination of direct and inverse variations.

• MODELING SITUATIONS WITH DIRECT AND INVERSE VARIATION

- **S.AII.10** The student will represent and solve problems, including practical problems, involving inverse variation, joint variation, and a combination of direct and inverse variations.

17. PARENT AND INVERSE FUNCTIONS

• PARENT FUNCTIONS

- **F.AII.6.a** recognize the general shape of function families; and

- **INVERSE FUNCTIONS**

- **F.AII.7.j** *inverse of a function; and*

18. WORKING WITH FUNCTIONS

- **TRANSFORMATIONS OF PARENT FUNCTIONS**

- **F.AII.6.b** *use knowledge of transformations to convert between equations and the corresponding graphs of functions.*

- **MULTIPLE TRANSFORMATIONS OF PARENT FUNCTIONS**

- **F.AII.6.b** *use knowledge of transformations to convert between equations and the corresponding graphs of functions.*

19. STATISTICS AND PROBABILITY

- **NORMAL DISTRIBUTION**

- **S.AII.11.a** *identify and describe properties of a normal distribution;*
- **S.AII.11.c** *apply properties of normal distributions to determine probabilities associated with areas under the standard normal curve.*
- **S.AII.11.b** *interpret and compare z-scores for normally distributed data; and*

- **COMBINATIONS AND PERMUTATIONS**

- **S.AII.12** *The student will compute and distinguish between permutations and combinations.*

- **SCATTERPLOTS AND MODELING**

- **S.AII.9** *The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve practical problems, using mathematical models of quadratic and exponential functions.*

20. 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**