

GED® Tutorials are based on content frameworks for the 2014 Test and current test specifications and provide students a less stressful and more successful preparation effort as they work to achieve a GED passing score.

GED Mathematical Reasoning and Reasoning through Language Arts (RLA) Tutorials offer targeted instruction, practice and review. Students engage with the content in an interactive, feedback-rich environment as they progress through GED test aligned modules. Students will practice skills essential to the test they're preparing for and build the depth of knowledge, confidence, and higher order skills required to demonstrate mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, guided analysis, and practice with personalized feedback so students are empowered to increase their Exam Readiness. The Review It offers an engaging and high impact video summary of key concepts and important to grasp connections. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers, linking a student's performance to GED reporting categories and reasoning indicators. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are ready for test day and where they need to continue their review and practice.

This Tutorial is aligned with 2014 assessment content from GED Testing Service and content area assessment targets for Mathematics and RLA sections.

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## 1. RATIOS AND RATES

- **RATIOS**

- **Q.3.c** Solve multistep, arithmetic, real-world problems using ratios or proportions including those that require converting units of measure.

- **RATES AND UNIT RATES**

- **Q.3.a** Compute unit rates. Examples include but are not limited to: unit pricing, constant speed, persons per square mile, BTUs per cubic foot.
- **Q.3.c** Solve multistep, arithmetic, real-world problems using ratios or proportions including those that require converting units of measure.

- **SOLVING PERCENT PROBLEMS**

- **Q.3.c** Solve multistep, arithmetic, real-world problems using ratios or proportions including those that require converting units of measure.

- **UNIT CONVERSIONS**

- **Q.3.c** Solve multistep, arithmetic, real-world problems using ratios or proportions including those that require converting units of measure.

## 2. NUMBER SENSE

- **GREATEST COMMON FACTOR AND LEAST COMMON MULTIPLE**

- **Q.1.b** Apply number properties involving multiples and factors, such as using the least common multiple, greatest common factor, or distributive property to rewrite numeric expressions.

- **SIMPLIFYING SQUARE ROOTS**

- **Q.2.b** Perform computations and write numerical expressions with squares and square roots of positive, rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

- **ABSOLUTE VALUE**

- **Q.1.d** Identify absolute value or a rational number as its distance from 0 on the number line and determine the distance between two rational numbers on the number line, including using the absolute value of their difference.

### 3. EXPONENTS AND SCIENTIFIC NOTATION

- **PROPERTIES OF EXPONENTS**

- **Q.1.c** Apply rules of exponents in numerical expressions with rational exponents to write equivalent expressions with rational exponents.
- **Q.2.b** Perform computations and write numerical expressions with squares and square roots of positive, rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

- **SCIENTIFIC NOTATION**

- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

### 4. ADDING AND SUBTRACTING RATIONAL NUMBERS

- **ADDING RATIONAL NUMBERS**

- **Q.2.a** Perform addition, subtraction, multiplication, and division on rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

- **SUBTRACTING RATIONAL NUMBERS**

- **Q.2.a** Perform addition, subtraction, multiplication, and division on rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

- **USING PROPERTIES TO ADD AND SUBTRACT RATIONAL NUMBERS**

- **Q.2.a** Perform addition, subtraction, multiplication, and division on rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

### 5. MULTIPLYING AND DIVIDING RATIONAL NUMBERS

- **MULTIPLYING RATIONAL NUMBERS**

- **Q.2.a** Perform addition, subtraction, multiplication, and division on rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

- **DIVIDING RATIONAL NUMBERS**

- **Q.2.a** Perform addition, subtraction, multiplication, and division on rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

- **USING PROPERTIES TO MULTIPLY AND DIVIDE RATIONAL NUMBERS**

- **Q.2.a** Perform addition, subtraction, multiplication, and division on rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

- **USING OPERATIONS ON RATIONAL NUMBERS TO SOLVE PROBLEMS**

- **Q.2.a** Perform addition, subtraction, multiplication, and division on rational numbers.
- **Q.2.e** Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation.

## 6. PROPORTIONAL RELATIONSHIPS

- **IDENTIFYING PROPORTIONAL RELATIONSHIPS**

- **A.7.a** Compare two different proportional relationships represented in different ways. Examples include but are not limited to: compare a distance-time graph to a distance-time equation to determine which of two moving objects has a greater speed.

- **ANALYZING PROPORTIONAL RELATIONSHIPS**

- **A.7.a** Compare two different proportional relationships represented in different ways. Examples include but are not limited to: compare a distance-time graph to a distance-time equation to determine which of two moving objects has a greater speed.

- **MULTIPLE REPRESENTATIONS OF PROPORTIONS**

- **A.5.c** Interpret unit rate as the slope in a proportional relationship.

## 7. APPLICATIONS OF PROPORTIONS

- **USING PROPORTIONS TO SOLVE PROBLEMS**

- **Q.3.d** Solve two-step, arithmetic, real world problems involving percents. Examples include but are not limited to: simple interest, tax, markups and markdowns, gratuities and commissions, percent increase and decrease.
- **MP.1.a** Search for and recognize entry points for solving a problem.

- **SCALE DRAWINGS**

- **Q.3.b** Use scale factors to determine the magnitude of a size change. Convert between actual drawings and scale drawings.

## 8. ALGEBRAIC EXPRESSIONS

- **WRITING EXPRESSIONS**

- **A.1.c** Write linear expressions as part of word-to-symbol translations or to represent common settings.

- **SIMPLIFYING AND REWRITING ALGEBRAIC EXPRESSIONS**

- **A.1.a** Add, subtract, factor, multiply and expand linear expressions with rational coefficients.
- **MP.4.a** Manipulate and solve arithmetic expressions.
- **MP.4.b** Transform and solve algebraic expressions.

- **FORMULATING AND SIMPLIFYING ALGEBRAIC EXPRESSIONS**

- **A.1.b** Evaluate linear expressions by substituting integers for unknown quantities.
- **A.1.e** Evaluate polynomial expressions by substituting integers for unknown quantities.

## 9. SOLVING EQUATIONS AND INEQUALITIES

- **MULTI-STEP EQUATIONS AND INEQUALITIES**

- **A.2.a** Solve one-variable linear equations with rational number coefficients, including equations whose solutions require

expanding expressions using the distributive property and collecting like terms or equations with coefficients represented by letters.

- **MP.1.b** Plan a solution pathway or outline a line of reasoning.
- **MP.1.c** Select the best solution pathway, according to given criteria.

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

- **A.2.b** Solve real-world problems involving linear equations.
- **A.2.c** Write one-variable and multi-variable linear equations to represent context.
- **MP.1.a** Search for and recognize entry points for solving a problem.
- **MP.1.d** Recognize and identify missing information that is required to solve a problem.
- **MP.2.a** Represent real world problems algebraically.
- **MP.2.c** Recognize the important and salient attributes of a problem.

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

- **A.3.a** Solve linear inequalities in one variable with rational number coefficients.
- **A.3.c** Solve real-world problems involving inequalities.
- **A.3.d** Write linear inequalities in one variable to represent context.
- **MP.1.a** Search for and recognize entry points for solving a problem.
- **MP.1.d** Recognize and identify missing information that is required to solve a problem.
- **MP.2.a** Represent real world problems algebraically.
- **MP.2.c** Recognize the important and salient attributes of a problem.
- **A.3.b** Identify or graph the solution to a one variable linear inequality on a number line.

## 10. INTRODUCTION TO FUNCTIONS

- **FUNCTIONS AND RELATIONS**

- **A.7.b** Represent or identify a function in a table or graph as having exactly one output (one element in the range) for each input (each element in the domain).

- **COMPARING FUNCTIONS**

- **A.7.d** Compare properties of two linear or quadratic functions each represented in a different way (algebraically, numerically in tables, graphically or by verbal descriptions). Examples include but are not limited to: given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

- **LINEAR VERSUS NONLINEAR FUNCTIONS**

- **A.5.e** For a function that models a linear or nonlinear relationship between two quantities, interpret key features of graphs and tables in terms of quantities, and sketch graphs showing key features of graphs and tables in terms of quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior, and periodicity.

## 11. LINEAR FUNCTIONS

- **SLOPE**

- **A.5.b** Determine the slope of a line from a graph, equation, or table.

- **GRAPHING AND ANALYZING LINEAR FUNCTIONS**

- **A.5.d** Graph two-variable linear equations.
- **A.7.c** Evaluate linear and quadratic functions for values in their domain when represented using function notation.

- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**

- **A.5.b** Determine the slope of a line from a graph, equation, or table.
- **A.5.e** For a function that models a linear or nonlinear relationship between two quantities, interpret key features of graphs and tables in terms of quantities, and sketch graphs showing key features of graphs and tables in terms of quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior, and periodicity.
- **A.6.b** Write the equation of a line passing through two given distinct points.
- **A.6.c** Use slope to identify parallel and perpendicular lines and to solve geometric problems.

- **POINT-SLOPE FORM OF A LINEAR EQUATION**

- **A.5.e** For a function that models a linear or nonlinear relationship between two quantities, interpret key features of graphs and tables in terms of quantities, and sketch graphs showing key features of graphs and tables in terms of quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior, and periodicity.
- **MP.4.c** Display data or algebraic expressions graphically.
- **A.6.b** Write the equation of a line passing through two given distinct points.
- **A.5.b** Determine the slope of a line from a graph, equation, or table.
- **A.6.c** Use slope to identify parallel and perpendicular lines and to solve geometric problems.

## 12. USING LINEAR FUNCTIONS

- **WRITING LINEAR FUNCTIONS**

- **A.2.c** Write one-variable and multi-variable linear equations to represent context.

- **GRAPHING AND MANIPULATING  $Y = MX + B$**

- **A.5.e** For a function that models a linear or nonlinear relationship between two quantities, interpret key features of graphs and tables in terms of quantities, and sketch graphs showing key features of graphs and tables in terms of quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior, and periodicity.

- **PARALLEL AND PERPENDICULAR LINES**

- **A.6.c** Use slope to identify parallel and perpendicular lines and to solve geometric problems.

## 13. SYSTEMS OF LINEAR EQUATIONS

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: GRAPHING**

- **A.2.d** Solve a system of two simultaneous linear equations by graphing, substitution, or linear combination. Solve real-world problems leading to a system of linear equations.

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: SUBSTITUTION**

- **A.2.d** Solve a system of two simultaneous linear equations by graphing, substitution, or linear combination. Solve real-world problems leading to a system of linear equations.

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: ELIMINATION**

- **A.2.d** Solve a system of two simultaneous linear equations by graphing, substitution, or linear combination. Solve real-world problems leading to a system of linear equations.

## 14. FACTORING POLYNOMIALS

- **FACTORING QUADRATIC TRINOMIALS**

- **A.1.f** Factor polynomial expressions.

- **FACTORING SPECIAL CASES**

- **A.1.f** Factor polynomial expressions.

## 15. SOLVING QUADRATIC EQUATIONS

- **SOLVING QUADRATIC EQUATIONS BY FACTORING**

- **A.4.a** Solve quadratic equations in one variable with rational coefficients and real solutions, using appropriate methods. (e.g., quadratic formula, completing the square, factoring, inspection).
- **MP.1.a** Search for and recognize entry points for solving a problem.

- **COMPLETING THE SQUARE**

- **A.4.a** Solve quadratic equations in one variable with rational coefficients and real solutions, using appropriate methods. (e.g., quadratic formula, completing the square, factoring, inspection).

- **QUADRATIC FORMULA**

- **A.4.a** Solve quadratic equations in one variable with rational coefficients and real solutions, using appropriate methods. (e.g., quadratic formula, completing the square, factoring, inspection).

## 16. OPERATIONS WITH POLYNOMIALS

- **ADDITION AND SUBTRACTION OF POLYNOMIALS**

- **A.1.d** Add, subtract, multiply polynomials, including multiplying two binomials, or divide factorable polynomials.

- **MULTIPLICATION OF POLYNOMIALS**

- **A.1.d** Add, subtract, multiply polynomials, including multiplying two binomials, or divide factorable polynomials.

- **DIVISION OF POLYNOMIALS**

- **A.1.d** Add, subtract, multiply polynomials, including multiplying two binomials, or divide factorable polynomials.

## 17. RATIONAL EXPRESSIONS AND FUNCTIONS

- **OPERATIONS WITH RATIONAL EXPRESSIONS**

- **A.1.h** Add, subtract, multiply and divide rational expressions.
- **MP.4.a** Manipulate and solve arithmetic expressions.
- **MP.4.b** Transform and solve algebraic expressions.

- **MODELING SITUATIONS WITH RATIONAL FUNCTIONS**

- **A.1.i** Evaluate rational expressions by substituting integers for unknown quantities.
- **A.1.j** Write rational expressions as part of word-to-symbol translations or to represent common settings.
- **MP.2.b** Represent real world problems visually.
- **MP.2.c** Recognize the important and salient attributes of a problem.

## 18. COORDINATE GEOMETRY

- **PLOTTING POINTS IN THE COORDINATE PLANE**

- **Q.4.a** Compute the area and perimeter of triangles and rectangles. Determine side lengths of triangles and rectangles when given area or perimeter.

- **PERIMETER ON THE COORDINATE PLANE**

- **Q.4.a** Compute the area and perimeter of triangles and rectangles. Determine side lengths of triangles and rectangles when given area or perimeter.
- **Q.4.c** Compute the perimeter of a polygon. Given a geometric formula, compute the area of a polygon. Determine side lengths of the figure when given the perimeter or area.
- **Q.4.d** Compute perimeter and area of 2-D composite geometric figures, which could include circles, given geometric formulas as needed.

## 19. TWO-DIMENSIONAL GEOMETRY

- **AREA, VOLUME, AND SURFACE AREA**

- **Q.4.c** Compute the perimeter of a polygon. Given a geometric formula, compute the area of a polygon. Determine side lengths of the figure when given the perimeter or area.
- **Q.4.d** Compute perimeter and area of 2-D composite geometric figures, which could include circles, given geometric formulas as needed.
- **Q.4.a** Compute the area and perimeter of triangles and rectangles. Determine side lengths of triangles and rectangles when given area or perimeter.
- **Q.5.a** When given geometric formulas, compute volume and surface area of rectangular prisms. Solve for side lengths or height, when given volume or surface area.

- **CIRCUMFERENCE AND ARC LENGTH**

- **Q.4.b** Compute the area and circumference of circles. Determine the radius or diameter when given area or circumference.

- **THE PYTHAGOREAN THEOREM**

- **Q.4.e** Use the Pythagorean theorem to determine unknown side lengths in a right triangle.

## 20. VOLUME

- **VOLUME OF CYLINDERS AND CONES**

- **Q.5.b** When given geometric formulas, compute volume and surface area of cylinders. Solve for height, radius, or diameter when given volume or surface area.
- **Q.5.d** When given geometric formulas, compute volume and surface area of right pyramids and cones. Solve for side lengths, height, radius, or diameter when given volume or surface area.

- **VOLUME OF PRISMS AND PYRAMIDS**

- **Q.5.c** When given geometric formulas, compute volume and surface area of right prisms. Solve for side lengths or height, when given volume or surface area.
- **Q.5.d** When given geometric formulas, compute volume and surface area of right pyramids and cones. Solve for side lengths, height, radius, or diameter when given volume or surface area.

- **VOLUME OF COMPOSITE SOLIDS**

- **Q.5.f** Compute surface area and volume of composite 3-D geometric figures, given geometric formulas as needed.

## 21. SURFACE AREA

- **SURFACE AREA OF CYLINDERS AND CONES**

- **Q.5.b** When given geometric formulas, compute volume and surface area of cylinders. Solve for height, radius, or diameter when given volume or surface area.
- **Q.5.d** When given geometric formulas, compute volume and surface area of right pyramids and cones. Solve for side lengths, height, radius, or diameter when given volume or surface area.

- **SURFACE AREA OF PRISMS AND PYRAMIDS**

- **Q.5.c** When given geometric formulas, compute volume and surface area of right prisms. Solve for side lengths or height, when given volume or surface area.
- **Q.5.d** When given geometric formulas, compute volume and surface area of right pyramids and cones. Solve for side lengths, height, radius, or diameter when given volume or surface area.

- **SURFACE AREA OF COMPOSITE SOLIDS**

- **Q.5.f** Compute surface area and volume of composite 3-D geometric figures, given geometric formulas as needed.

- **SURFACE AREA AND VOLUME OF SPHERES**

- **Q.5.e** When given geometric formulas, compute volume and surface area of spheres. Solve for radius or diameter when given the surface area.

## 22. STATISTICS

- **BOX PLOTS**

- **Q.6.b** Represent, display, and interpret data involving one variable plots on the real number line including dot plots, histograms, and box plots.
- **MP.4.c** Display data or algebraic expressions graphically.

- **DOT PLOTS AND HISTOGRAMS**

- **Q.6.b** Represent, display, and interpret data involving one variable plots on the real number line including dot plots, histograms, and box plots.
- **MP.4.c** Display data or algebraic expressions graphically.

- **USING STATISTICAL MEASURES TO COMPARE DATA SETS**

- **Q.7.a** Calculate the mean, median, mode and range. Calculate a missing data value, given the average and all the missing data values but one, as well as calculating the average, given the frequency counts of all the data values, and calculating a weighted average.

- **SCATTERPLOTS**

- **Q.6.c** Represent, display, and interpret data involving two variables in tables and the coordinate plane including scatter plots and graphs.
- **MP.4.c** Display data or algebraic expressions graphically.

## 23. PROBABILITY

- **INTRODUCTION TO PROBABILITY**

- **Q.8.a** Use counting techniques to solve problems and determine combinations and permutations.

- **CALCULATING PROBABILITY**

- **Q.8.b** Determine the probability of simple and compound events.

- **PROBABILITY OF COMPOUND EVENTS**

- **Q.8.b** Determine the probability of simple and compound events.

- **COMBINATIONS AND PERMUTATIONS**

- **Q.8.a** Use counting techniques to solve problems and determine combinations and permutations.