GED Prep: Math

Course Description

GED Prep: Math prepares students for the GED Math exam. The course includes an academic year of content, and covers the following GED subject strands: Number Operations and Number Sense; Measurement and Geometry; Data Analysis, Statistics, and Probability; Algebra, Functions, and Patterns.

Interactive components within each topic serve to engage students and enhance learning.

- Step-by-step examples are presented on a virtual blackboard.
- Interactive geometry software provides hands-on practice.
- Self-check activities give students instant feedback.
- Lesson quizzes and comprehensive tests assess knowledge and provide feedback.
- Discussion groups and application assignments integrate writing and reading skills throughout the course, and relate mathematics to real-life experiences.

Overview

Unit 1 – Number Operations and Number Sense

Lesson 1: Place Value, Exponents, and Order of Operations
Lesson 2: Introduction to Expressions and Equations
Lesson 3: Introduction to Integers
Lesson 4: Addition and Subtraction
Lesson 5: Multiplication
Lesson 6: Division
Lesson 7: Factors and Factorization
Lesson 8: Greatest Common Factors and Fractions
Lesson 9: Least Common Multiples and Fractions
Lesson 10: Working with Fractions and Percent

Unit 2 – Measurement and Geometry

Lesson 1: Rate of Change
Lesson 2: Graphs of Linear Equations
Lesson 3: Points, Lines, and Planes
Lesson 4: The Metric System and Measuring
Lesson 5: Angles
Lesson 6: Slope and Distance
Lesson 7: Right Triangles, Quadrilaterals, and Polygons
Lesson 8: Area of Polygons and Circles
Lesson 9: Surface Area and Volume
Lesson 10: Transformations

Unit 3 – Data Analysis, Statistics, and Probability

Lesson 1: Displaying Data
Lesson 2: Measures of Variation
Lesson 3: Fundamental Counting Principles
Lesson 4: Probability

Unit 4 – Algebra, Functions, and Patterns

Lesson 1: Combined Operations
Lesson 2: Introduction to the Coordinate Plane and Equations
Lesson 3: Solving Equations Analytically

Lesson 4: Equations and Problem Solving
Lesson 5: Functions and Relations
Lesson 6: Variation
Lesson 7: Solving Systems of Equations
Lesson 8: Solving Quadratic Equations
Lesson 9: Quadratic Equations and Problem Solving

Objectives

Unit 1: Number Operations and Number Sense

- Compare integers with the "greater-than" (>) and "less-than" (<) symbols, and compare integers on a number line.
- Convert word problems to math equations, solve word problems, and use computation skills to solve problems.
- Work with expressions involving exponents and numbers in standard form.
- Add, subtract, multiply, and divide integers using models and rules.
- Simplify expressions by using grouping symbols, exponents, and the order of operations.
- Solve addition, subtraction, multiplication, and division equations using the appropriate rules.
- Use the least common multiple to compare fractions with different denominators, and use fractions to compare information in real-life situations.
- Use the Fundamental Theorem of Arithmetic to express prime factorizations.
- Use percent proportions to solve real-life percent problems.

Unit 2: Measurement and Geometry

- Demonstrate knowledge of points, including collinear points.
- Identify the intersection of two lines.
- Use the distance and midpoint formulas.
- Identify, describe, compare, and classify adjacent angles, vertical angles, supplementary angles, and complementary angles.
- Use the Pythagorean Theorem to find the missing side of a right triangle and to solve word problems.
- Find the area and perimeter of squares, rectangles, parallelograms, composite shapes, rhombi, trapezoids, and circles.
- Find the volume and surface area of prisms, pyramids, cylinders, cones, and spheres.
- Describe, identify, and solve problems involving reflections, translations, rotations, and dilations.
- Understand and use the relationship between scale factors in similar three-dimensional objects, and the ratios of surface area and volume.
- Solve distance, rate, and time problems using graphs of linear equations.
- Use ratios to determine if given data is a direct variation, and write equations based on direct variation models.
- Perform basic conversions using the metric system and determine which units would work best in various real-life situations.

Unit 3: Data Analysis, Statistics, and Probability

- Calculate the mean, median, mode, and range of a data set.
- Draw a line of best fit for a set of data and use the line of best fit to describe data.
- Read and create stem-and-leaf plots, pie charts, bar graphs, double bar graphs, and histograms.
- Identify the best measure of central tendency to accurately represent a data set.
- Find the number of possible outcomes using permutations.
- Recognize the difference between using a permutation and a combination.
- Calculate theoretical probability.
- Use the formula for experimental probability.
- Tell the difference between biased and unbiased sampling.
- Use statistics to predict outcomes.

Unit 4: Algebra, Functions, and Patterns

- Simplify algebraic expressions by combining like terms, and evaluate algebraic expressions by substituting a value for the variable.
- Solve geometric problems involving perimeter and area.
- Identify the quadrants in the coordinate plane and graph points on the coordinate plane.
- Write functions using function notation and understand the meaning of domain and range.
- Graph linear equations by finding ordered pairs.
- Write, graph, and solve linear equations that represent real-world relationships.
- Solve quadratic equations by factoring and using the Zero Product Rule; by completing the square; and by using the quadratic formula.
- Find the vertex, axis of symmetry, and maximum or minimum values of the graph of a quadratic function.
- Solve application problems involving direct variation.

Throughout all units, students will develop the following skills:

- Communicate mathematically by expressing ideas, analyzing situations, explaining procedures for correct computation, and describing results numerically and graphically.
- Use the Internet to gain useful information.
- Use newsgroups and email to communicate with teachers and classmates, and develop a sense of class membership.

Activities and Assessments

- **10 Online Discussion Group Assignments** – In selected lessons, students are given a topic for a Discussion Group assignment related to the material being covered. The teacher evaluates the students' contributions to the discussion and provides grading and feedback.

- **5 Algebra and 2 Geometry Application Assignments** – Teacher-graded algebra and geometry application assignments help students relate learning to real-life experiences, require them to communicate their thoughts and findings, and enable them to explore other math-related websites.

- **33 Lesson Quizzes, 4 Unit Exams, and 1 Final Exam/Post Test** – Along with numerous practice sets in each lesson, there is a quiz at the end of each of the 33 lessons in the course, and an evaluation at the end of each of the four units. At the conclusion of the course, students are given one opportunity to complete a comprehensive final exam. All of these assessments are computer-graded and provide students with feedback on their work.