

Grade 8

Adopted 2023

Eighth Grade

Math Attributes

Problem-Solving

- P. Learners can analyze information and formulate a flexible, systematic plan to problem-solve authentic situations and reflect on the reasonableness of the solution, making revisions when necessary. **8.MA.P**

Connections

- C. Learners can create connections within and across concepts and provide examples of how they relate to other learning and ideas using supporting evidence. **8.MA.C**

Reasoning and Proof

- R. Learners can reason logically, citing evidence to evaluate and explain what they see, think, and conclude through exploration and justification. **8.MA.R**

Number and Operations

Number Systems

1. Compare and classify real numbers within the real number system. **8.NO.NS.1**
2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them on a number line diagram, and estimate the value of irrational expressions involving one operation. **8.NO.NS.2**
3. Use scientific notation to represent very large or very small quantities. Interpret scientific notation generated by technology. Compare and order numbers in both scientific and standard notation. **8.NO.NS.3**

Operations

1. Evaluate mentally the square roots of perfect squares up to 225 and cube roots of perfect cubes up to 1000. **8.NO.O.1**
2. Add, subtract, multiply, and divide rational numbers using strategies or procedures. **8.NO.O.2**

Algebraic Reasoning

Expressions and Equations

1. Explain the relationship between repeated multiplication and the properties of integer exponents. Apply a single exponent property to generate equivalent numeric and algebraic expressions that include numerical coefficients. **8.AR.EE.1**
2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a non-negative rational number. **8.AR.EE.2**
3. Explain the characteristics of a linear relationship, including identifying the slope and y-intercept in tables, graphs, equations, and descriptions. **8.AR.EE.3**
4. Represent linear relationships using tables, graphs, equations, and descriptions when given a relationship in one of these forms. **8.AR.EE.4**
5. Solve linear equations with rational number coefficients and variables on both sides, including equations that require using the distributive property and/or combining and collecting like terms. Interpret the number of solutions. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. **8.AR.EE.5**
6. Read, write, and evaluate numerical and algebraic expressions including expressions involving absolute value. Solve and graph equations of the form $|x| = r$ where r is a nonnegative rational number. **8.AR.EE.6**
7. Solve and graph inequalities in one variable with rational number coefficients and variables on both sides, including inequalities that require using the distributive property and/or combining like terms. **8.AR.EE.7**
8. Graph linear inequalities in two variables on a coordinate plane. Interpret the possible solutions in the context of authentic problems. **8.AR.EE.8**

Functions

1. Defend whether a relation is a function from various representations using appropriate function language. **8.AR.F.1**
2. Compare and contrast properties of two linear functions, each represented in a different way (algebraically, graphically, numerically in tables, and/or by descriptions). **8.AR.F.2**
3. Compare and contrast linear and non-linear functions represented in different ways (algebraically, graphically, numerically in tables, and/or by descriptions). **8.AR.F.3**
4. Model a linear function between two quantities by creating a table, graph, and equation. Interpret the rate of change and initial value of a linear function in terms of the situation it models. **8.AR.F.4**
5. Describe qualitatively the functional relationship between two quantities by analyzing a graph including where the function is constant, increasing, or decreasing; linear or nonlinear; and discrete or continuous. Create a graph that exhibits the qualitative features of a function described. **8.AR.F.5**

Geometry and Measurement

Area and Volume

1. Apply given formulas to solve problems involving the volume of cones, cylinders, and spheres, including authentic problems. [8.GM.AV.1](#)

Geometric Figures

1. Perform single transformations to a figure on the coordinate plane and determine whether the figures are congruent or similar. [8.GM.GF.1](#)
2. Describe the characteristics of transformations on the coordinate plane using transformation language. [8.GM.GF.2](#)
3. Name the type of transformation needed to map a pre-image to its image. [8.GM.GF.3](#)
4. Describe the following angle-pair relationships: interior and exterior angles of triangles and angles formed when a transversal cuts parallel lines or intersecting lines. Solve for an unknown angle in a figure by applying facts about these angles. [8.GM.GF.4](#)
5. Describe the relationship between the leg lengths and the hypotenuse length of a right triangle. Determine whether a triangle is a right triangle using this relationship. [8.GM.GF.5](#)
6. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in two and three dimensions on and off a coordinate plane, including authentic problems. [8.GM.GF.6](#)

Data, Probability, and Statistics

Data Analysis

1. Interpret scatter plots for bivariate measurement data to investigate patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. [8.DPS.D.1](#)
2. Draw an informal trend line on a given scatter plot with a linear association and justify its fit by describing the closeness of the data points to the line. [8.DPS.D.2](#)
3. Solve authentic problems in the context of bivariate measurement data by interpreting the slope and intercept(s) and making predictions using a linear model. [8.DPS.D.3](#)
4. Construct and interpret a two-way table summarizing bivariate categorical data collected from the same subjects. [8.DPS.D.4](#)