Math

Grade 8 Essential Standards

EXPRESSIONS AND EQUATIONS

8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \cdot 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$

8.EE.5: Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has a great speed.

8.EE.7: Solve linear equations in one variable.

a) Give example of linear equations in one variable with one solution, infinite many solutions, and no solutions. Show which of these possibilities is the case by successively transforming the given equations into simpler forms, until an equivalent equations of the form x = a, a=a, or a=b results (where "a" and "b" are different numbers).

b) Solve linear equations with rational number coefficients, including equations whose solution require expanding expression using the distributive property and collecting like terms.

8.EE.8 Analyze and solve pairs of simultaneous linear equations.

a) Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

b) Solve systems of two linear equations in two variables algebraically, and estimate c. solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and*

c) Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for*

two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

FUNCTIONS

8.F.2: Compare properties of two functions each represent in a different way (algebraically, graphically, numerically in tables, or by verbal description). For example, 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.

8.F.3: Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function* $A = s^2$ *giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line*.

8.F.4: Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

GEOMETRY

8.G.4: Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

8.G.6: Explain the proof of the Pythagorean Theorem and its converse.

8.G.7: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.