

Module 4, Topic A, Vocabulary

Associative property: The grouping in an addition or multiplication problem may change, but the sum or product will remain the same.

Coefficient: In the term $3y^6$, for example, the 3 represents the coefficient, or the number in front of the base (y). It means that y^6 is being multiplied by 3.

Commutative property: The order of an addition or multiplication problem may change, but the sum or product will remain the same.

Consecutive integers: Consecutive integers are integers that come one after another when counting. For example, $-6, -5, -4,$ and -3 are consecutive integers. Likewise, 4, 6, and 8 are consecutive even integers.

Constant of a linear equation/expression: The number that is being added to the variable term. For example, in the linear equation $3x - 4 = 8 + 6x$, -4 and 8 are the constants in the equation.

Distributive property: Allows the numbers in a multiplication problem to be distributed into partial products (i.e., partial answers). The partial products can then be added together to find the product, or the answer to the original multiplication problem (e.g., $3(x + 7) = (3 \cdot x) + (3 \cdot 7) = 3x + 21$).

Exponent: In the term $3y^6$, the 6 is the exponent. The exponent tells you how many times to multiply the base (y) by itself.

Linear expression: The sum/difference of one or more expressions (e.g., $4x - 5$) that consist of either a number, a variable, or the product of a number and a variable, where the variable is raised to the power of 0 or 1. The expression $4x^3 - 5$ is nonlinear because the variable is raised to the third power.

Properties of equality: Each property of equality states that if you add (subtract, multiply, or divide) by a number on one side of an equation, you can add (subtract, multiply, or divide) by that same number on the other side of the equation without changing the value of the variable or the equality of the statement.

Reciprocal: The number obtained by inverting a fraction. For example, 4 (which is $\frac{4}{1}$) and $\frac{1}{4}$ are reciprocals, as are $\frac{3}{4}$ and $\frac{4}{3}$. When you multiply a number by its reciprocal, the product is always 1.

Solutions of a linear equation: There are three possibilities for the solution to a linear equation. If both sides of the equation are transformed using the commutative, associative, and/or distributive properties and you notice that ...

- the coefficients of the variable terms are the same, and the constants are also the same (e.g., $3x + 4 = 4 + 3x$ in both instances), then the equation has infinitely many solutions.
- the coefficients of the variable terms are the same, but the constants are different (e.g., $-8x + 7 = -8x - 6$ in both instances), then the equation has no solution.
- the coefficients of the variable terms are different regardless of the constant (e.g., $6 - \frac{1}{4}x = 7x + 4$ in both instances), then the equation has one unique solution.

Variable term: In a linear equation, the part of the expression containing the coefficient and variable. For example, in the linear equation $3x - 4 = 8 + 6x$, $3x$ and $6x$ are the variable terms.

Module 4, Topic B, Vocabulary

Constant rate: The rate at which something can be done that is the same over any time interval. For example, a typist might type at a constant rate of 200 words per minute, and a racing cyclist might ride at a constant speed of 25 miles per hour.

Coordinates: The location of a point on the coordinate plane, written as (x, y) . The first number is always the x -value of the point (left/right), and the second number is always the y -value of the point (up/down).

Linear equation in two variables: An equation with two variables (e.g., $y = 2x + 4$). The variables have exponents of 1 or 0 only and cannot be the denominator in a fraction when the equation is in standard form. All linear equations can be graphed as straight lines in the coordinate plane. Other examples include $x = 3$ (implies $0y + 1x = 3$) and $\frac{1}{4}c - 8v = 9$.

Proportional relationship: When two quantities (e.g., the weight of an item and its price) increase or decrease at the same rate, their relationship is proportional. If 1 pound of tomatoes sells for \$4 (1:4) and 2 pounds sell for \$8 (2:8), the weight and price are proportional. That is, each measure in the second quantity (4 and 8), when divided by its corresponding measure in the first quantity (1 and 2), produces the same number (4), called a constant.

Module 4, Topic C, Vocabulary

Intercept point: The point $(0, b)$ at which a line intersects the y -axis where b is the y -value of the y -intercept point. There is also an x -intercept point, $(x, 0)$, where the line intersects the x -axis.

Slope: A number that describes the steepness or slant of a line. The unit rate (e.g., number of miles per hour) or rate of change (how one quantity changes in relation to another) is often interpreted as the slope of a graph. Lines that go up from left to right have a positive slope, and lines that go down from left to right have a negative slope. The slope, m , of a line can be found using the following equation:

$$m = \frac{\text{difference in } y\text{-values}}{\text{difference in } x\text{-values}} = \frac{p_2 - r_2}{p_1 - r_1} = \frac{y_2 - y_1}{x_2 - x_1}.$$

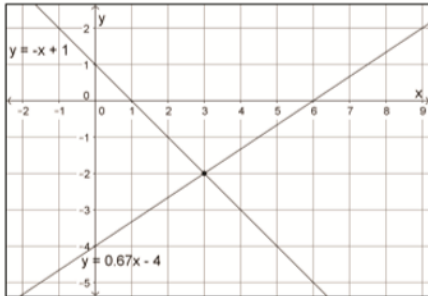
Slope-intercept form of a linear equation: A linear equation written as $y = mx + b$, where m represents the slope of the line and b represents the y -value of the y -intercept point.

Standard form of a linear equation: The standard form of a linear equation is written as $ax + by = c$ (e.g., $2x + 3y = 17$).

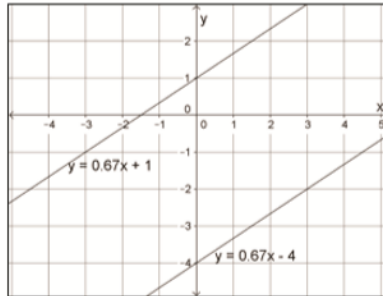
Module 4, Topics D & E, Vocabulary

Ordered pair: Two numbers written in a fixed order, usually as (x, y) .

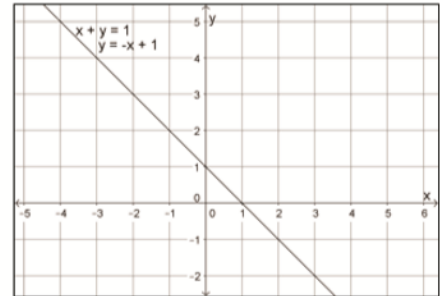
Simultaneous equations/Systems of equations: Two or more two-variable equations that have one common solution, graphically represented by where the graphs intersect. There are also systems of equations with no solution, which would graph as parallel lines, and some with infinitely many solutions, which would graph as the same line. (See images below.)



One Solution



No Solution



Infinite Solutions

Hypotenuse of a right triangle: The longest side of the right triangle. The hypotenuse is opposite the right angle.

Leg of a right triangle: One of the two shorter sides of the right triangle. Together, the legs form the right angle.

Pythagorean theorem: If the triangle is a right triangle, then $leg_1^2 + leg_2^2 = hypotenuse^2$, or $a^2 + b^2 = c^2$.

Pythagorean triple: Three positive integers that represent the lengths of the sides of a right triangle and that successfully fulfill the Pythagorean theorem.

