Algebra 1: Principles of Secondary Mathematics
Glossary

Glossary Content

Glossary terms are linked to their respective pages. Page references are for the page numbers within the glossary, not pages within the Student Worktext. For specific lesson references, please see the individual terms.

I

L

M

N

O

P

Q

R

S

T

U

V

W

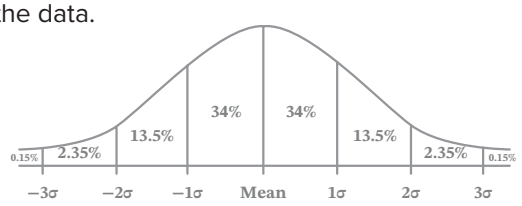
X

Y

Z

68-95-99.7 Rule, Lesson 6

A rule that states the values that are within one standard deviation from the mean (in either direction) will make up about 68% of the data. The values that are within a distance of two standard deviations from the mean (in either direction) will make up about 95% of the data. The values that are within a distance of three standard deviations from the mean will make up about 99.7% of the data.



absolute value, Lesson 3

The magnitude (size) of a number, or distance without direction.

$$|x| = 4$$
$$x = -4, 4$$

absolute value inequality, Lesson 4

Absolute value inequalities are compound inequalities without the words AND or OR. The direction of the inequality symbol will determine whether the absolute value inequality is an AND or OR compound inequality, assuming the absolute value expression is isolated on one side of the inequality.

$$|x - 4| < 3$$

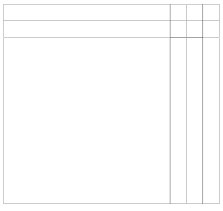
Addition Property of Equality, Lesson 1

If $a = b$, then $a + c = b + c$

$$n + 5 = 10$$
$$n + 5 + 3 = 10 + 3$$

area model, Lesson 23

A model used for showing multiplication problems where a rectangle is formed with the sides representing the factors and the area representing the product.



$(x + 2)$

$(x + 3)$

arithmetic sequence, Lesson 14

$a_n = a_1 + d(n - 1)$; a sequence in which the same value is added to each term to get to the next term, making the common difference between any two consecutive terms the same.

$$R: \{2, 7, 12, 17, 22, 27, 32, 37, \ldots\}$$
$$a_n = 2 + 5(n - 1)$$

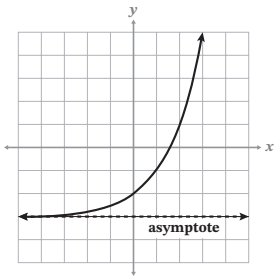
Associative Property, Lesson 1

$a + (b + c) = (a + b) + c$
$a(bc) = (ab)c$

$$2 + (8 + x) = (2 + 8) + x,$$
$$3(6x) = (3 \cdot 6)(x)$$

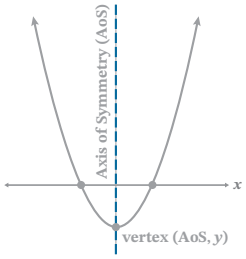
asymptote, Lesson 30

The line on the graph of an exponential function that the function approaches but never reaches, which is represented by k.



axis of symmetry (AoS), Lesson 26

The imaginary vertical line that contains the minimum or maximum point of the parabola and splits the graph into symmetric halves. The formula to calculate the axis of symmetry is $x = -\left(\frac{b}{2a}\right)$.

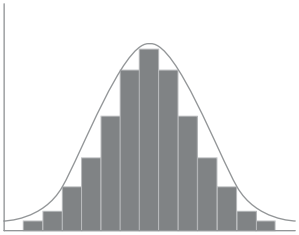


bar graph, Lesson 6

A graph that uses bars to compare specific values or categories, with a vertical number line that represents the total number of elements in each category.

bell curve, Lesson 6

A type of graph used to represent normally distributed data, which resembles the shape of a bell.



binomial, Lesson 20

A polynomial containing two terms.

$$x + 3$$

bivariate data, Lesson 13

A set of data that pairs independent and dependent variables together to form a relationship called a correlation.

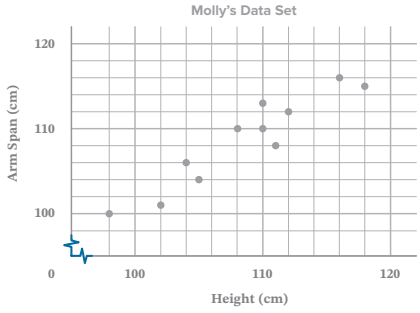
$$R = \{(3, 10), (4, 15), (5, 20), (6, 25)\}$$

box plot, Lesson 6

A graph that divides a data set into four parts, or quartiles, each with the same number of elements. A box is drawn between the first and third quartiles, enclosing the median. This box represents the middle half of the data elements. Then lines, or "whiskers," are drawn from the minimum to the first quartile and from the third quartile to the maximum.

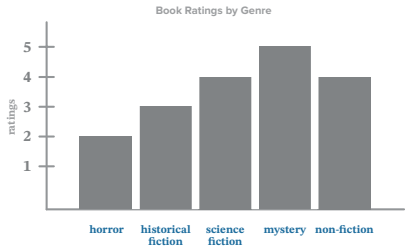
break in data, Lesson 13

Notation used to graphically represent either axis not starting at 0.



categorical data, Lesson 6

Data that is divided into categories or groups.



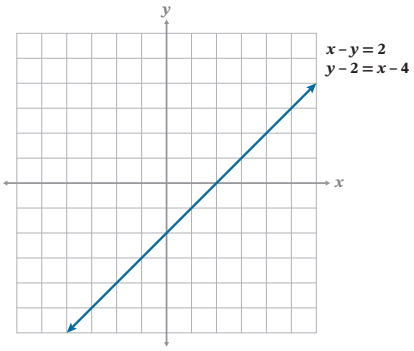
coefficient, Lesson 1

A number or letter that is multiplied by a variable.

$$-\frac{1}{4}x + 10 = 9.5$$

coincident lines, Lesson 15

Lines graphed exactly on top of one another in a two dimensional plane.



common difference, Lesson 14

The difference between any two terms in an arithmetic sequence. The difference must be equal between any two terms for an arithmetic sequence.

$$R: \{2, 7, 12, 17, 22, 27, 32, 37, \ldots\}$$
$$d = 5$$

Commutative Property, Lesson 1

For real numbers, $a + b = b + a$, and $ab = ba$

$$5 + 7 = 7 + 5$$
$$(6)(2) = (2)(6)$$

completing the square, Extension Lesson 1

The process of finding the value of c such that $ax^2 + bx + c$ is a perfect square trinomial.

$$x^2 - 12x + 35 = 0$$
$$x^2 - 12x + \_\_\_ = -35 + \_\_\_$$
$$x^2 - 12x + (-6)^2 = -35 + (-6)^2$$
$$(x - 6)^2 = 1$$
$$x = 6 \pm 1$$

compound inequality, Lesson 4

An inequality that uses AND or OR statements to combine the solutions of two inequalities onto one number line.

$$x > 3 \text{ AND } x < 10$$

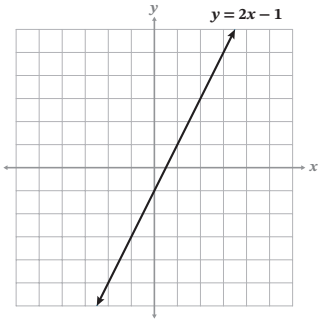
constant, Lesson 20

A degree 0 term, or a numerical term, within an expression.

$$11 = 2x + 7$$

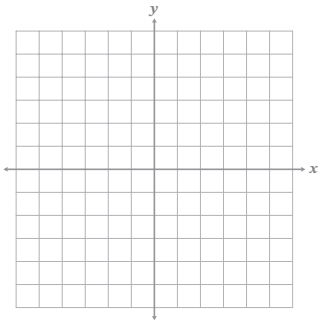
continuous function, Lesson 14

A function in which a domain element cannot be distinguished from the "next" domain element or is written as a single interval; the graph of a continuous function creates a smooth curve (or line).



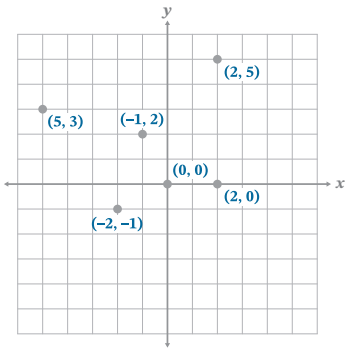
coordinate plane, Lesson 7

A two-dimensional graph formed by a horizontal number line called the x-axis and a vertical number line called the y-axis. It is used for graphing ordered pairs or points, as well as other types of algebraic graphs such as lines.



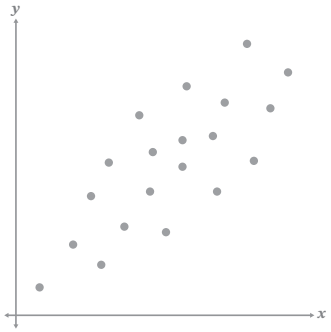
coordinates, Lesson 7

The x- and y-values that indicate the location of a point on the coordinate plane. See *ordered pair.*



correlation, Lesson 13

The relationship between two variables, independent and dependent, or two data sets.



cross product, Lesson 5

The result of multiplying the numerator of one ratio by the denominator of the other ratio in a proportion.

$$\frac{3}{4} = \frac{9}{12} \qquad 36 \qquad 36$$

cubic, Lesson 20

Having third degree terms but no higher.

$$2x^3 + 7x + 8$$

data, Lesson 6

A collection, or set, of information that can be quantitative or categorical.

Customer Ratings for Harvey's Restaurant
Star Ratings: {1, 3, 3, 4, 4, 4, 5, 5}

degree, Lesson 20

The largest exponent in a single variable polynomial expression. Names for degree classification include constant, linear, quadratic, cubic, and nth degree.

Degree	Classification
x^0	constant
x^1	linear
x^2	quadratic
x^3	cubic
$x^n; n \geq 4$	degree n

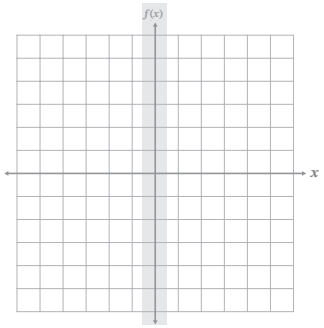
degree n, Lesson 20

A classification of polynomials that contain fourth degree terms or higher.

$$x^n; n \geq 4 \text{ (e.g., } x^5, x^6, x^7, \ldots x^n)$$

dependent variable, Lesson 7

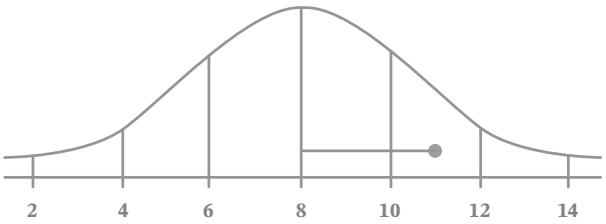
The variable in a function that is dependent on the other variable for its value. On the coordinate plane this variable is represented by $f(x)$.



dependent x	y
−2	4
−1	5
0	5
1	6

deviation, Lesson 6

The difference between an element and a fixed value, such as the mean.



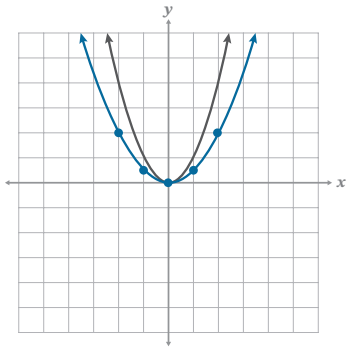
difference of two squares, Lesson 22

A special type of quadratic binomial where both terms are perfect squares that are subtracted from one another.

$$x^2 - y^2 = (x - y)(x + y)$$

dilate, Lesson 27

To compress or stretch a graph making it narrower or wider.



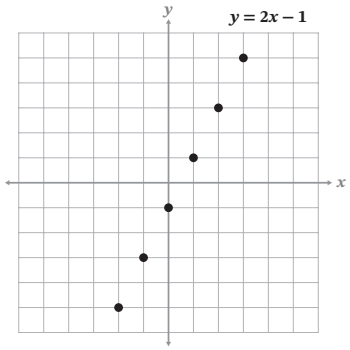
dimensional analysis, Lesson 5

The process of converting one unit of measure to another. See *unit conversion*.

$$(24.5 \text{ yd})\left(\frac{3 \text{ ft}}{1 \text{ yd}}\right) = 73.5 \text{ ft}$$

discrete function, Lesson 14

A function in which each domain element can be distinguished from the next domain element; the graph of a discrete function is made of separate points.



discriminant, Extension Lesson 2

The part of the quadratic formula under the square root symbol, $b^2 - 4ac$, that determines the number of real solutions to a quadratic equation.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Distributive Property, Lessons 1, 20

$a(b + c) = ab + ac$
$a(b - c) = ab - ac$

$$12(20 + 5) = 12(20) + 12(5)$$

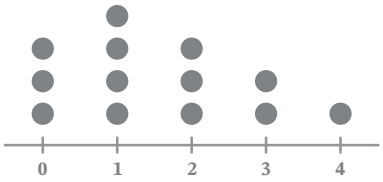
domain, Lesson 7

The set of valid input values, or x-coordinates (x, y).

domain x	y
-2	4
-1	5
0	5
1	6

dot plot, Lesson 6

A graph that uses dots, or other basic shapes, to represent each element in a data set.



exponent, Lesson 19

The number of times that a base is multiplied by itself. See *power*.

extraneous information, Lesson 10

Information that is irrelevant to the problem but sometimes provided to distract from the needed values.

extraneous

Carrie got in her car at 8 a.m. to drive to work. After a half-hour, she had traveled 25 miles. When she parked her car 45 minutes after leaving her house, she had traveled 37.5 miles.

Write the linear equation that represents the scenario and explain what the slope and y-intercept represent in context.

extraneous solution, Lesson 25

A value that is mathematically correct but is not true for the context of the problem or makes the original equation untrue.

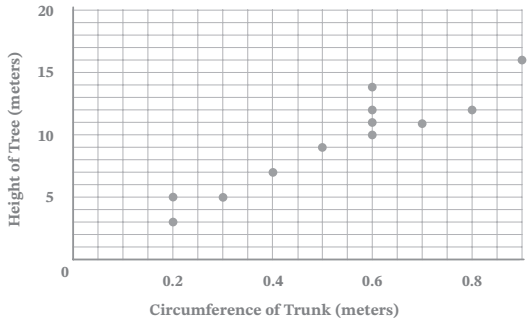
$x + 2$

x | $A = 48$ | $x = 6 \quad x = -8$

The solution $x = -8$ is extraneous because the sides of a figure cannot be negative.

extrapolation, Lesson 13

Predicting values in a data set beyond the set of data.



Extrapolation would be using the given graph to predict the circumference of a trunk when the height is 35 meters.

factor (of a term), Lesson 22

The parts of a term that are multiplied together to form the product.

$6xy$, possible factors are $2x$ and $3y$

factor pairs, Lesson 22

Two terms that when multiplied together result in the given term.

Whole number factor pairs for 15 are $1 \cdot 15$ and $3 \cdot 5$

factoring, Lesson 21

Expressing/writing a polynomial as a product of two or more factors (the inverse of the Distributive Property).

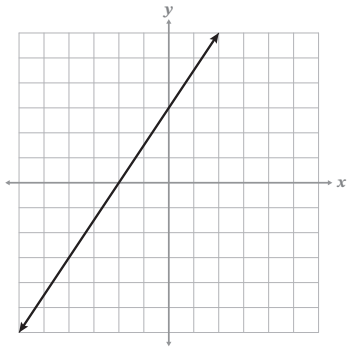
$$x^2 + 5x + 6 = (x + 3)(x + 2)$$

five-number summary, Lesson 6

A summary of values used to create the boundaries for the minimum (Q0), the first quartile (Q1), the median (Q2), the third quartile (Q3), and the maximum (Q4).

function, Lesson 7

A special type of relation that has exactly one result (or output) for every input value.



greatest common factor (GCF), Lessons 1, 20

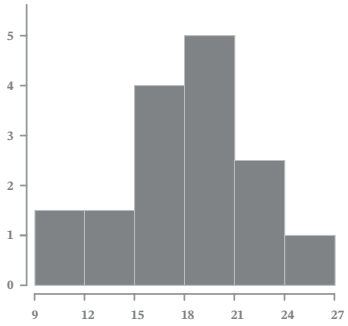
The largest term you can factor out of a set of terms or an expression.

$$\text{GCF}\,(50, 75, 100) = 25$$

$$\text{GCF}\,(30x^2y^4, 18xy^2, 12xy^2) = 6xy^2$$

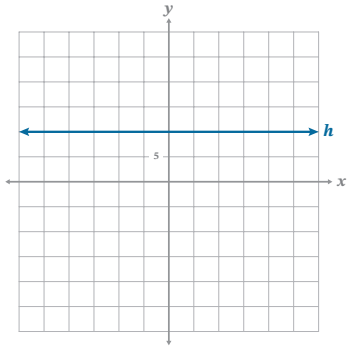
histogram, Lesson 6

A graph with a horizontal axis containing equal intervals of data and a vertical axis that shows the number of elements in each interval.



horizontal line, Lesson 11

A line in which the input (or x-values) can be any real number, and the output (or y-value) is equal to the y-intercept; $y = b$



identity, Lesson 2

An equation whose solution is all real numbers.

$$18 = 6(x + 3) - 6x$$
$$18 = 6x + 18 - 6x$$
$$18 = 18$$
all real numbers, or $\mathbb{R}$

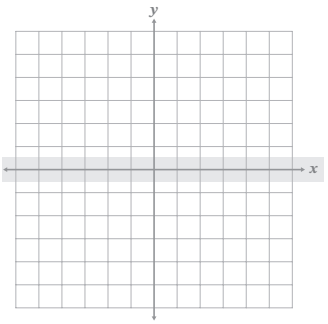
Identity Property, Lesson 1

$a + 0 = a$
$a \cdot 1 = a$

$$2 + 0 = 2$$
$$2 \cdot 1 = 2$$

independent variable, Lesson 7

The variable in a function that does not depend on the other variable for its value. On the coordinate plane, this variable is x.



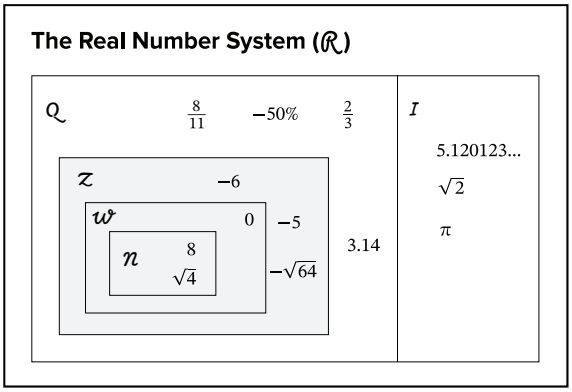
	independent
x	y
-2	4
-1	5
0	5
1	6

inequality, Lesson 4

A comparison of expressions or values that are not equal.

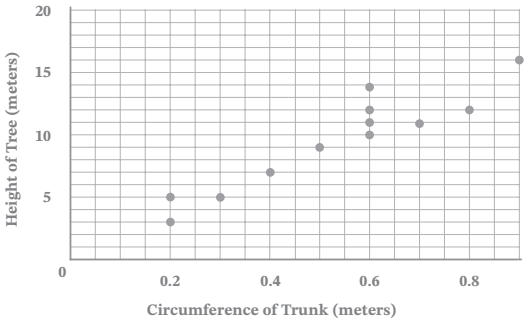
integers ($\mathbb{Z}$), Lesson 1

Positive and negative whole numbers or $\{..., -3, -2, -1, 0, 1, 2, 3, ...\}$.



interpolation, Lesson 13

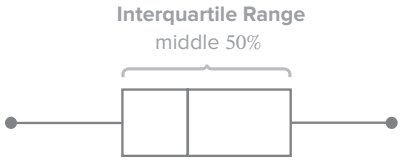
Predicting values in a data set between given data points.



Interpolation would be using the given data set to determine the circumference of a tree with a height of 6 meters.

interquartile range (IQR), Lesson 6

The spread of the middle fifty percent of the data set based on the median value.



interval, Lesson 14

The set of all values between two numbers.

interval notation, Lesson 14

One way to express every element in an interval.

$[8, 10)$

Inverse Property, Lesson 1

$a + (-a) = 0$

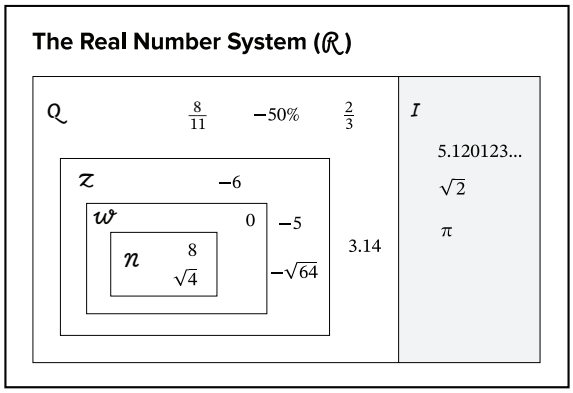
$\frac{a}{b} \cdot \left(\frac{b}{a}\right) = 1$

$$\frac{3}{4} + \left(-\frac{3}{4}\right) = 0$$

$$\frac{2}{3} \cdot \frac{3}{2} = 1$$

irrational number ($\mathcal{I}$), Lesson 1

Any number that is not rational (i.e., a number with no ratio, or fraction, that is exactly equal to its decimal value).



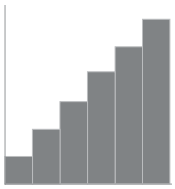
leading coefficient, Lesson 20

The coefficient of the term with the largest degree in an expression; the number in front of the first term in an expression written in standard form.

$$2x^3 + 5x - 11$$

left-skewed (data set), Lesson 6

A data set that contains fewer points on the left-hand side of the graph, which pull the mean in their direction.



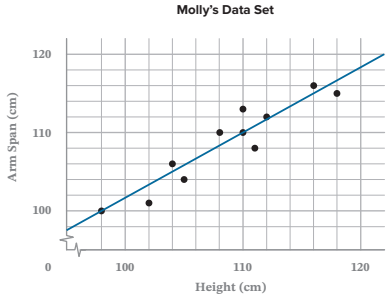
like terms, Lesson 1

Any base raised to the same power.

$$5x^2 \text{ and } -3x^2$$

line of best fit, Lesson 13

A line that passes through, or as close as possible to, the most number of data points on a scatter plot, representing the trends between the two data sets.



linear, Lesson 20

Having terms to the first degree but no higher.

$$0 = 2x + 3$$

linear combinations, Lesson 16

A method to solve a system of linear equations in which one or more equations in the system are multplied by a constant to eliminate a variable when the equations are added together.

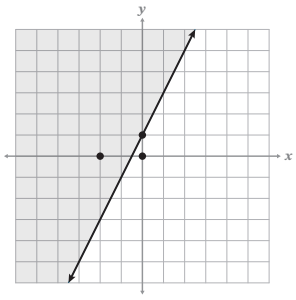
$$\begin{aligned} 6x + 7y &= 2 \\ 5x + 8y &= 6 \\ (-5)(6x + 7y &= 2) \\ -30x - 35y &= -10 \\ (6)(5x + 8y &= 6) \end{aligned}$$

$$\begin{aligned} 30x - 48y &= 36 \\ +\ -30x - 35y &= -10 \\ \hline 13y &= 26 \\ y &= 2 \end{aligned}$$

$$\begin{aligned} 6x + 7(2) &= 2 \\ 6x + 14 &= 2 \\ 6x &= -12 \\ x &= -2 \end{aligned}$$

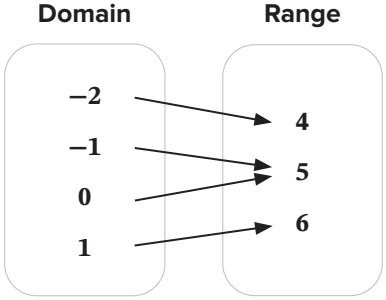
linear inequality, Lesson 15

A comparison of two expressions with two variables that uses one of the following symbols: $>, <, \leq, \geq$



mapping, Lesson 7

A representation of a relation where arrows connect the elements of the domain to the corresponding elements of the range.



mean ($\bar{x}$), Lesson 6

The average value in a data set.

$$\frac{(5+3+1+3+\ +8+5+5+3+5)}{10} = \frac{40}{10} = 4$$

median (med, Q2), Lesson 6

The middle element of an ordered data set.

$$\{1, 2, 3, 3, 3, \textcircled{5}, 5, 5, 5, 8, 8\}$$

mode, Lesson 6

The most frequently occurring element in a data set.

monomial, Lesson 20

A polynomial containing one term.

Number of Terms	Classification
x	monomial
$x + 3$	binomial
$x^2 + x + 3$	trinomial
$x^3 + x^2 + x + 3$	polynomial with n-terms

Multiplication Property of Equality, Lesson 1

If $a = b$, then $ac = bc$

$$5n = 10$$

$$\left(\frac{1}{5}\right)(5n) = (10)\left(\frac{1}{5}\right)$$

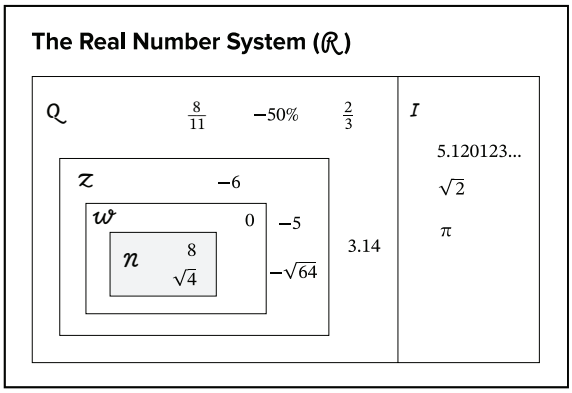
Multiplicative Inverse Property, Lesson 1

$\frac{a}{b} \cdot \left(\frac{b}{a}\right) = 1$

$$\left(\frac{1}{x}\right)\left(\frac{x}{1}\right) = 1$$

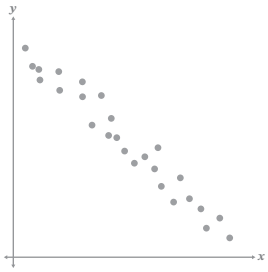
natural numbers ($\mathcal{N}$), Lesson 1

The set of numbers that begins with one or $\{1, 2, 3, ...\}$.



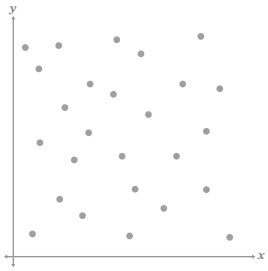
negative correlation, Lesson 13

The relationship between two variables where the independent variable increases as the dependent variable decreases when moving from left to right across the graph.



no correlation, Lesson 13

When no relationship exists between the independent and dependent variables.



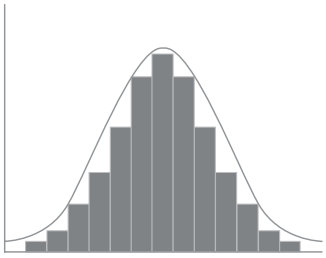
no solution, Lesson 2

The solution to an equation in which no substituted value will make the statement true.

$$3x = 3x + 1$$
$$0 \neq 1$$

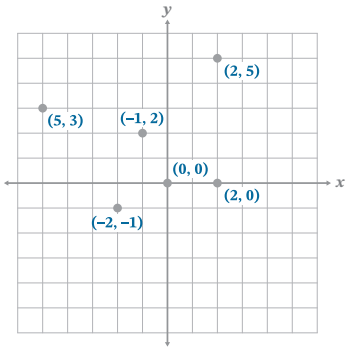
normal distribution, Lesson 6

A data set that contains more elements in the center and fewer on the ends. The middle is the highest point and the graph gets smaller as you move away from the middle.



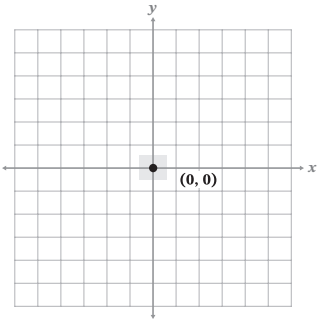
ordered pair (x, y), Lessons 7, 8

A set of numbers that represents a point on the coordinate plane. They are written as (x, y) where x represents the horizontal direction of the point and y represents the vertical direction of the point.



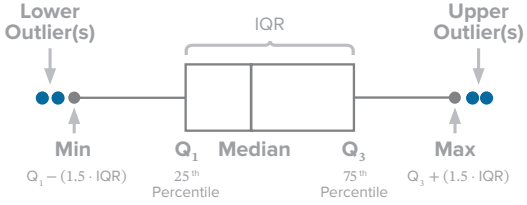
origin, Lesson 7

The point $(0, 0)$ where the x-axis and y-axis intersect on a coordinate plane.



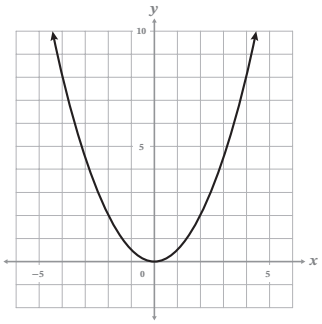
outliers, Lesson 6

Elements that are outside of the overall pattern of the given data set.



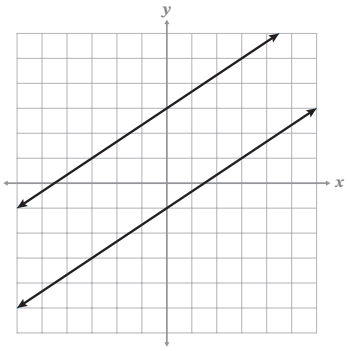
parabola, Lesson 26

A symmetric, u-shaped graph that represents a quadratic function.



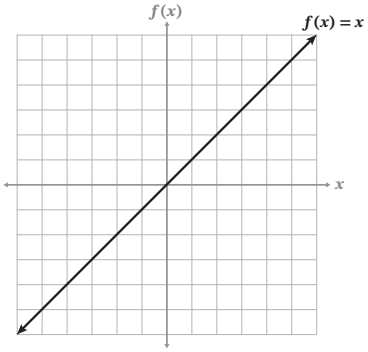
parallel lines, Lesson 12

Two or more lines on the same coordinate plane which have equal slope but are different lines; following the x-axis the lines are the same distance apart and have no points in common.



parent function, Lesson 8

The simplest form of a function in a family of functions.



perfect square, Lesson 22

The product of a number times itself (the inverse is the square root).

$$25 = 5 \cdot 5$$

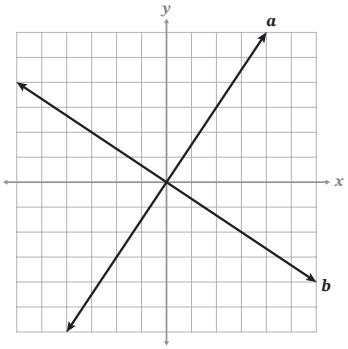
perfect square trinomial, Lesson 22

The product of a binomial squared.

$$x^2 + 2xy + y^2 = (x + y)^2$$

perpendicular lines, Lesson 12

Two lines that can be drawn in the same plane and intersect at right angles; the slope of these lines are opposite reciprocals with a product of -1.



point-slope form, Lesson 9

A way to write a linear equation when provided the slope and a specific point on the line; $y - y_1 = m(x - x_1)$ where (x_1, y_1) is a point on the line that is known, and m is the slope of the line.

$$y - 2 = -\frac{1}{3}(x - 6)$$

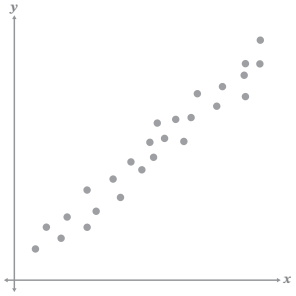
polynomial, Lesson 20

An expression containing one or more terms. Specific names for polynomials include monomial, binomial, trinomial, where the prefix describes the number of terms.

$$x^2 + 6x + 9$$

positive correlation, Lesson 13

The relationship between two variables where the independent and dependent variables both increase when moving from left to right across the graph.



power, Lesson 19

The number of times that a base is multiplied by itself. See *exponent*.

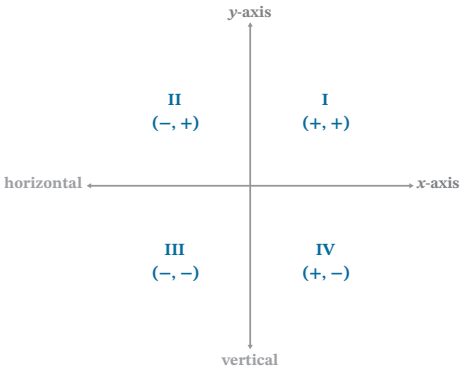
proportion, Lesson 5

An equation that sets two ratios equal to one another.

$$\frac{3}{4} = \frac{9}{12}$$

quadrant, Lesson 7

A quarter of the coordinate plane, labeled counterclockwise with the Roman Numerals I, II, III, and IV.



quadratic, Lesson 20

Having terms to the second degree but no higher.

$$x^2 + 4x + 3$$

quadratic formula, Extension Lesson 2

The formula, $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, that can be used to solve any quadratic equation in standard form.

$$a = -1, b = -3, c = 7$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(-1)(7)}}{2(-1)}$$

$$x = -\frac{3 \pm \sqrt{37}}{2}$$

quantitative data, Lesson 6

Data that is numerical.

range (of a data set), Lesson 6

The distance between the maximum and minimum elements in a data set.

$$\{19, 19, 20, 21, 21, 22, 23, 23, 24, 25, 28, 28, 29\}$$

Range: $29 - 19 = 10$

range (of a relation), Lesson 7

The set of possible output values, or y-coordinates (x, y).

	range
x	y
-2	4
-1	5
0	5
1	6

ratio, Lesson 5

A comparison of two numbers using division. A ratio can be written as $\frac{a}{b}$, $a{:}b$, or a to b.

The farm had a ratio of 5 sheep to 2 dogs, or 5:2.

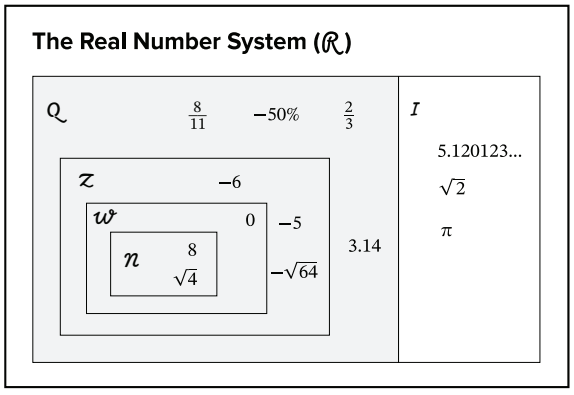
rational expression, Lesson 28

An expression in which the numerator and/or denominator contain polynomials.

$$\frac{(a^5 b^8)}{c^3}$$

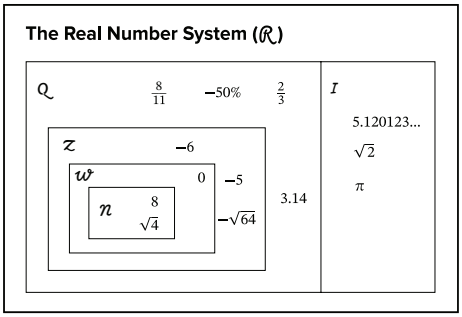
rational number ($\mathbb{Q}$), Lesson 1

A value that can be written as a ratio (or fraction) of integers, $\frac{a}{b}$, where b is not equal to 0.



real numbers ($\mathbb{R}$), Lesson 1

The set of numbers that include all rational and irrational numbers that can be graphed on a number line.



reciprocal, Lesson 28

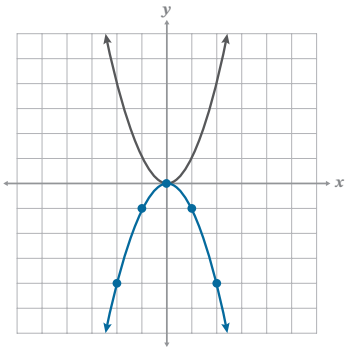
A pair of values a pair of values that when multiplied together result in one. The inverse of a number or value.

$$\textbf{The reciprocal of } \frac{2}{3} \textbf{ is } \frac{3}{2}.$$

$$\textbf{The reciprocal of } \frac{1}{x} \textbf{ is } \frac{x}{1}.$$

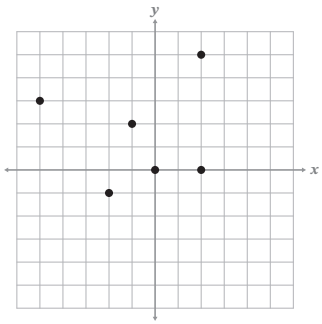
reflect, Lesson 27

To flip a graph across a horizontal line creating a mirrored version of the graph.



relation, Lesson 7

A statement that represents a relationship between two variables and can be represented visually on a coordinate plane or written as a set of ordered pairs such as (x, y).



repeated substitution, Lesson 7

A method of evaluating functions in which multiple input values are substituted into the function rule to determine the corresponding output values.

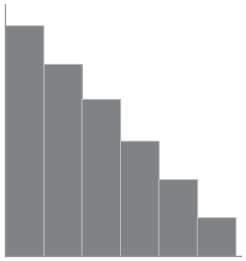
$$f(x) = -3(x)$$

$$f(-1) = -3(-1)$$
$$f(-1) = 3$$

$$f(0) = -3(0)$$
$$f(0) = 0$$

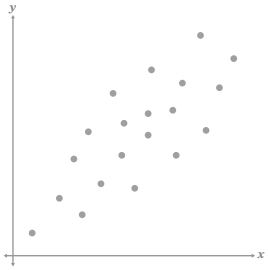
right-skewed (data set), Lesson 6

A data set that contains fewer points on the right-hand side of the graph, which pull the mean in their direction.



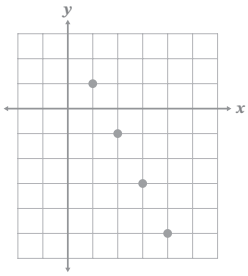
scatter plot, Lesson 13

A type of graph that represents bivariate data.



sequence, Lesson 14

A discrete function in which the domain is made up of only natural numbers.



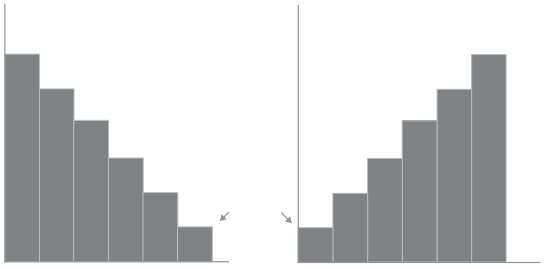
simplest form, Lesson 21

An expression written with only one occurrence of a term of each degree.

$$2x^2 + 3x + 1$$

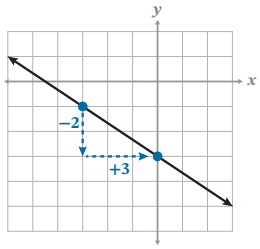
skewed data, Lesson 6

A data set that contains more points on one side of the graph than the other. The side with fewer points pulls the mean away from the more commonly occuring elements in the set.



slope (m), Lesson 8

The rise to run ratio between any two points on a line.



$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = -\frac{2}{3}$$

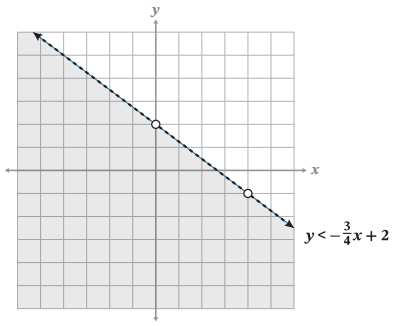
slope-intercept form, Lesson 9

A way to write a linear equation using the slope and the y-intercept; $y = mx + b$ where m is the slope and b is the y-intercept.

$$y = 3x + 7$$

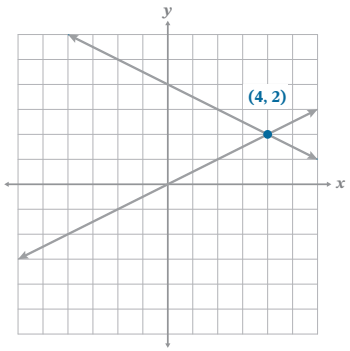
solution (to a linear inequality), Lesson 15

The shaded region of ordered pairs that makes the inequality true. The shaded region of ordered pairs that make the inequality true.



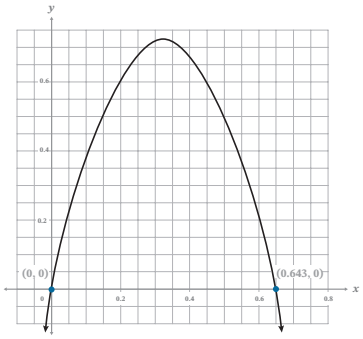
Solution (to a system of equations), Lesson 15

An ordered pair where the lines of the system intersect.



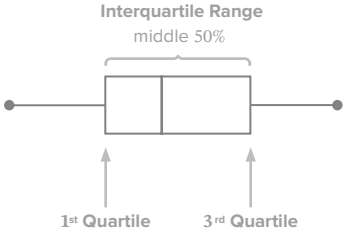
solutions (to a quadratic equation), Lesson 26

The value of the x-intercepts for a quadratic equation. The solutions are also called roots or zeros and can be found by factoring, completing the square, estimating them from the graph, using graphing technology, or using the quadratic formula. There can be zero, one, or two solutions to a quadratic equation.



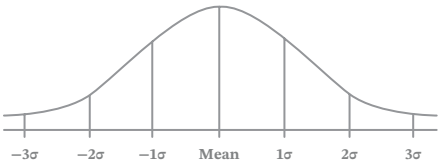
spread, Lesson 6

How far apart the elements of a data set are from one another.



standard deviation (σ), Lesson 6

The average distance (or deviation) of elements in the data set from the mean.



standard form, Lesson 11

$Ax + By = C$; a linear equation where A is a whole number, B and C are integers, and the greatest common factor of A, B, and C is equal to 1. This form is useful when making quick graphs using the x- and y-intercept.

$$2x + 6y = 8$$

standard form (for polynomials), Lesson 20

Polynomial terms written in descending order by degree.

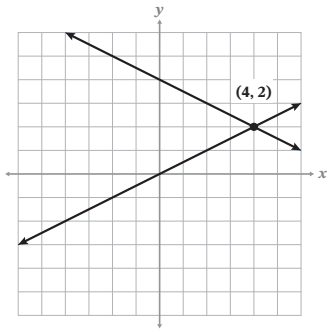
$$2x^3 + 5x^2 - 3x + 11$$

system of equations, Lesson 15

Two or more equations grouped together.

$y = -\frac{1}{2}x + 4$

$x - 2y = 0$

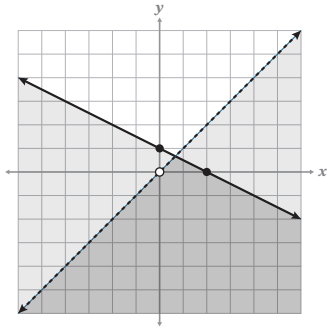


system of inequalities, Lesson 15

Two or more inequalities grouped together.

$y \leq -\frac{1}{2}x + 1$

$y > x$



term, Lesson 1

A single number, a single variable, or the product of a number and a variable.

$$\underbrace{3x}_{\text{terms}} + \underbrace{5}_{\text{terms}} = \underbrace{15}_{\text{terms}}$$

terms (of a sequence), Lesson 14

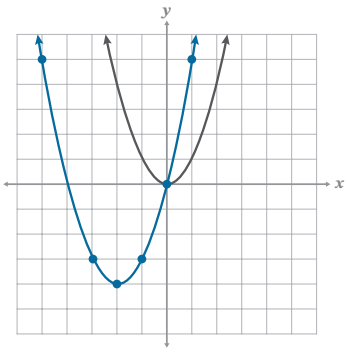
Each number in a sequence where the subscript represents the location of the number in sequential order.

R: $\{2, 7, 12, 17, 22, 27, 32, 37, \ldots\}$

$a_1 = 2, a_2 = 7, a_3 = 12, \ldots, a_n = n$**th term in sequence**

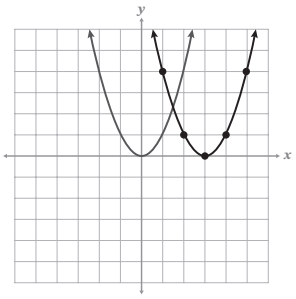
transform, Lesson 27

To translate, reflect, and/or dilate a graph.



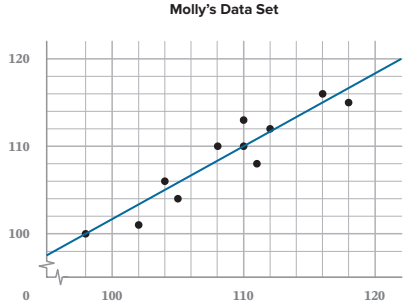
translate, Lesson 27

To slide a graph left, right, up, or down.



trend line, Lesson 13

A line that represents the trends or tendencies between two data sets.



trinomial, Lesson 20

A polynomial containing three terms.

$$x^2 + 7x + 12$$

unit conversion, Lesson 5

The process of converting one unit of measure to another. See *dimensional analysis.*

$$(24.5 \text{ yd})\left(\frac{3 \text{ ft}}{1 \text{ yd}}\right) = 73.5 \text{ ft}$$

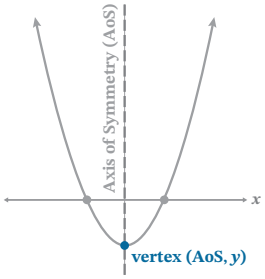
unit multiplier, Lesson 5

A ratio that is equal to 1 containing different units.

$$\frac{3 \text{ ft}}{1 \text{ yd}}$$

vertex, Lesson 26

The minimum or maximum point of a parabola. To find the vertex before graphing, use (AoS, y) or $\left(-\frac{b}{2a}, f\left(\frac{-b}{2a}\right)\right)$.



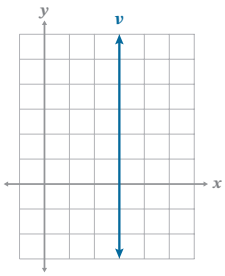
vertex form, Lesson 27

A form for quadratic functions that is used to make transforming quadratic graphs more efficient. Vertex form is $y = a(x - h)^2 + k$, where (h, k) is the vertex.

$$y = 3(x + 1)^2 - 4$$

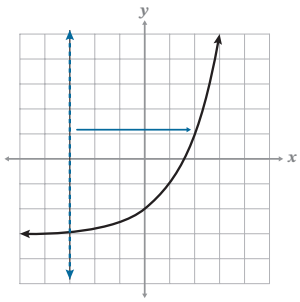
vertical line, Lesson 11

A line that has a single x-value, and the output can be any real number; $x = a$.



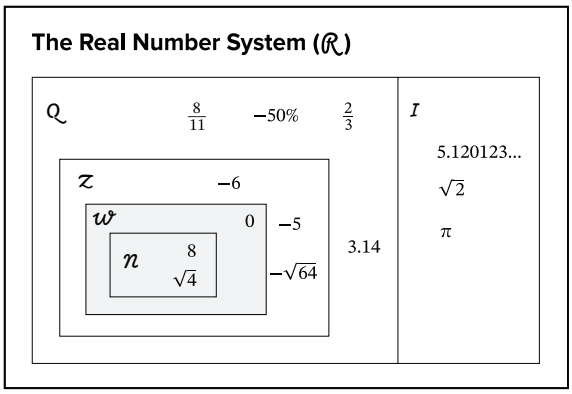
vertical line test (VLT), Lesson 7

A visual representation that determines whether a graph on the coordinate plane is a function by running a vertical line across the graph. If the vertical line touches more than one point at a time, the graph is not a function.



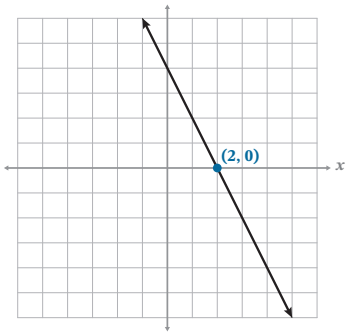
whole numbers ($\mathcal{W}$), Lesson 1

The set of numbers that begins with zero or $\{0, 1, 2, ...\}$.



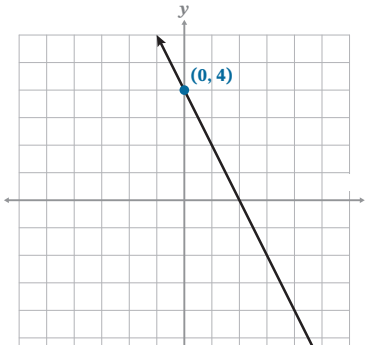
x-intercept $(a, 0)$, Lesson 8

The x-coordinate where the function intersects the x-axis and where the value of y is equal to 0.



y-intercept $(0, b)$, Lesson 8, 10

The y-coordinate where the line crosses the y-axis and where the value of x is equal to 0.



Zero-Product Property, Lesson 1, 24

$a \cdot 0 = 0$; any value multiplied by zero is equal to zero.

If $ab = 0$, then $a = 0$ or $b = 0$; if the product of an equation is zero, then at least one of the factors is also zero.

If $(x + 2)(x + 3) = 0$, then $(x + 2)$ or $(x + 3) = 0$