Vocabulary Flash Cards

absolute value equation *Chapter 1 (p. 28)*	**conjecture** *Chapter 1 (p. 3)*
equation *Chapter 1 (p .4)*	**equivalent equations** *Chapter 1 (p. 4)*
extraneous solution *Chapter 1 (p. 31)*	**formula** *Chapter 1 (p. 37)*
identity *Chapter 1 (p. 21)*	**inverse operations** *Chapter 1 (p. 4)*

Vocabulary Flash Cards

An unproven statement about a general mathematical concept The product of an even and an odd number is always an even number.	An equation that contains an absolute value expression $\lvert x \rvert = 2$ $\lvert x + 1 \rvert = 5$ $3\lvert 2x + 1 \rvert = 6$
Equations that have the same solution(s) $2x - 8 = 0$ and $2x = 8$	A statement that two expressions are equal $4x = 16$ $a + 7 = 21$
A literal equation that shows how one variable is related to one or more other variables $A = \ell w$ $I = Prt$ $d = rt$	An apparent solution that must be rejected because it does not satisfy the original equation When you square each side of $x = \sqrt{x + 2}$, the resulting equation has two solutions, $x = -1$ and $x = 2$. However, $x = -1$ is an extraneous solution because it does not satisfy the original equation.
Two operations that undo each other, such as addition and subtraction Multiplication and division are inverse operations.	An equation that is true for all values of the variable $2(x + 1) = 2x + 2$ $-3(2x + 3) = -6x - 9$

Vocabulary Flash Cards

linear equation in one variable *Chapter 1 (p. 4)*	**literal equation** *Chapter 1 (p. 36)*
rule *Chapter 1 (p. 3)*	**solution of an equation** *Chapter 1 (p. 4)*
theorem *Chapter 1 (p. 3)*	

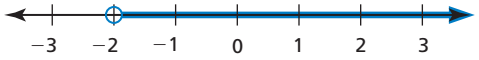
Vocabulary Flash Cards

An equation that has two or more variables $2y + 6x = 12$	An equation that can be written in the form $ax + b = 0$, where a and b are constants and $a \neq 0$ $5x + 6 = 0$ $3x = 8$
A value that makes an equation true The solution of the equation $x - 4 = 2$ is 6.	A proven statement about a general mathematical concept; also known as a theorem The Pythagorean Theorem
	A proven statement about a general mathematical concept The Pythagorean Theorem

Vocabulary Flash Cards

absolute deviation *Chapter 2 (p. 90)*	**absolute value inequality** *Chapter 2 (p. 88)*
compound inequality *Chapter 2 (p. 82)*	**equivalent inequalities** *Chapter 2 (p. 62)*
graph of an inequality *Chapter 2 (p. 56)*	**inequality** *Chapter 2 (p. 54)*
solution of an inequality *Chapter 2 (p. 55)*	**solution set** *Chapter 2 (p. 55)*

Vocabulary Flash Cards

An inequality that contains an absolute value expression $\lvert x \rvert < 7$ $\lvert x - 3 \rvert \geq 5$ $4\lvert 2x + 4 \rvert \leq 16$	The absolute value of the difference of a number x and a given value absolute deviation $= \lvert x - \text{given value} \rvert$
Inequalities that have the same solutions $3x + 5 > 0$ and $3x > 5$	An inequality formed by joining two inequalities with the word "and" or the word "or" $x \geq 2$ and $x < 5$ $y \leq -2$ or $y > 1$ $4 < x - 1 < 7$
A mathematical sentence that compares expressions $x - 4 < -14$ $x + 5 \geq -67$	A graph that shows the solution set of an inequality on a number line $x > -2$ 
The set of all solutions of an inequality 5 is in the solution set of $x > 1$ 3 is not in the solution set of $x \leq 1$	A value that makes an inequality true A solution of the inequality $x + 3 > -9$ is $x = 2$.

Vocabulary Flash Cards

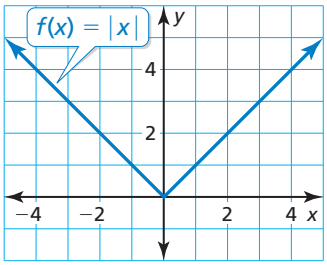
absolute value function *Chapter 3 (p. 156)*	**constant function** *Chapter 3 (p. 138)*
continuous domain *Chapter 3 (p. 114)*	**dependent variable** *Chapter 3 (p. 107)*
discrete domain *Chapter 3 (p. 114)*	**domain** *Chapter 3 (p. 106)*
family of functions *Chapter 3 (p. 146)*	**function** *Chapter 3 (p. 104)*

Vocabulary Flash Cards

A linear equation written in the form $y = 0x + b$, or $y = b$

$y = 0x + 5$, or $y = 5$

A function that contains an absolute value expression

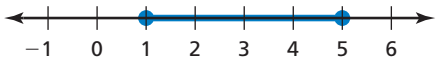


The variable that represents output values of a function

In the function $y = 2x - 3$, y is the dependent variable.

A set of input values that consist of all numbers in an interval

All numbers from 1 to 5

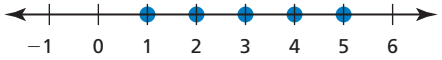


The set of all possible input values of a function

For the ordered pairs $(0, 6)$, $(1, 7)$, $(2, 8)$, and $(3, 9)$, the domain is 0, 1, 2, and 3.

A set of input values that consists of only certain numbers in an interval

Integers from 1 to 5



A relation that pairs each input with exactly one output

The ordered pairs $(0, 1)$, $(1, 2)$, $(2, 4)$, and $(3, 6)$ represent a function.

Ordered Pairs	Input	Output
(0, 1)	0	1
(1, 2)	1	2
(2, 4)	2	4
(3, 6)	3	6

A group of functions with similar characteristics

Linear functions and absolute value functions are families of functions.

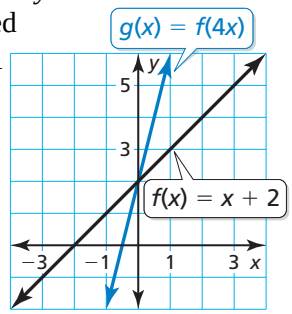
Vocabulary Flash Cards

function notation *Chapter 3 (p. 122)*	**horizontal shrink** *Chapter 3 (p. 148)*
horizontal stretch *Chapter 3 (p. 148)*	**independent variable** *Chapter 3 (p. 107)*
linear equation in two variables *Chapter 3 (p. 112)*	**linear function** *Chapter 3 (p. 112)*
nonlinear function *Chapter 3 (p. 112)*	**parent function** *Chapter 3 (p. 146)*

Vocabulary Flash Cards

A transformation that causes the graph of a function to shrink toward the y-axis when all the x-coordinates are multiplied by a factor a, where $a > 1$

The graph of g is a horizontal shrink of the graph of f by a factor of $\frac{1}{4}$.



Another name for y denoted as $f(x)$ and read as "the value of f at x" or "f of x"

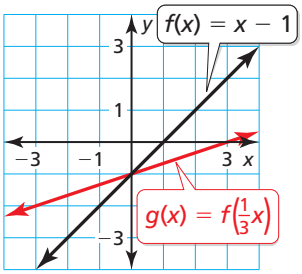
$y = 5x + 2$ can be written in function notation as $f(x) = 5x + 2$.

The variable that represents the input values of a function

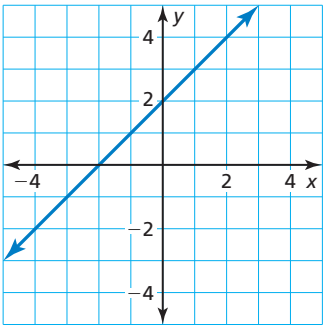
In the function $y = 5x - 8$, x is the independent variable.

A transformation that causes the graph of a function to stretch away from the y-axis when all the x-coordinates are multiplied by a factor a, where $0 < a < 1$

The graph of g is a horizontal stretch of the graph of f by a factor of $1 \div \frac{1}{3} = 3$.



A function whose graph is a nonvertical line



An equation that can be written in the form $y = mx + b$, where m and b are constants

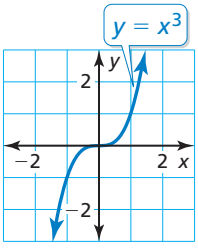
$y = 4x + 3$

$6x + 2y = 0$

The most basic function in a family of functions

For linear functions, the parent function is $f(x) = x$.

A function that does not have a constant rate of change and whose graph is not a line



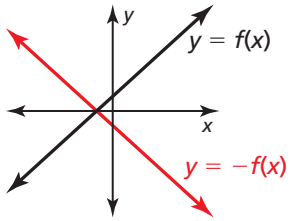
Vocabulary Flash Cards

range of a function *Chapter 3 (p. 106)*	**reflection** *Chapter 3 (p. 147)*
relation *Chapter 3 (p. 104)*	**rise** *Chapter 3 (p. 136)*
run *Chapter 3 (p. 136)*	**slope** *Chapter 3 (p. 136)*
slope-intercept form *Chapter 3 (p. 138)*	**solution of a linear equation in two variables** *Chapter 3 (p. 114)*

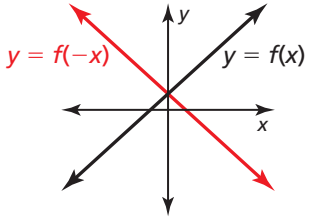
Vocabulary Flash Cards

A transformation that flips a graph over a line called the *line of reflection*

Reflection in the *x*-axis



Reflection in the *y*-axis

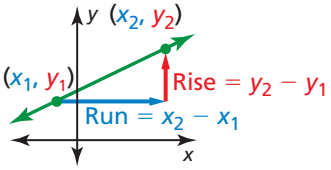


The set of all possible output values of a function

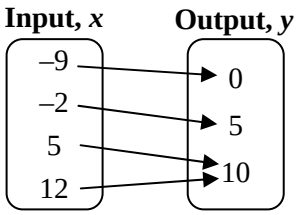
For the ordered pairs $(0, 6)$, $(1, 7)$, $(2, 8)$, and $(3, 9)$, the range is 6, 7, 8, and 9.

The change in y between any two points on a line

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$

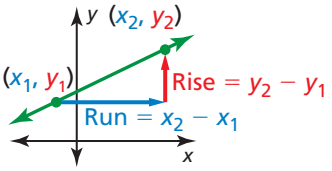


A pairing of inputs with outputs



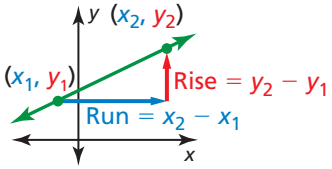
The rate of change between any two points on a line

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$



The change in x between any two points on a line

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$

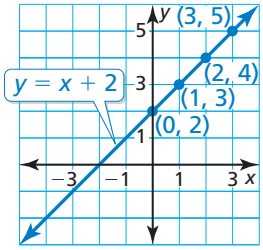


An ordered pair (x, y) that makes an equation true

A solution of $x + 2y = -6$ is $(2, -4)$.

A linear equation written in the form $y = mx + b$

The slope is 1 and the *y*-intercept is 2.



Vocabulary Flash Cards

standard form of a linear equation *Chapter 3 (p. 130)*	**transformation** *Chapter 3 (p. 146)*
translation *Chapter 3 (p. 146)*	**vertex** *Chapter 3 (p. 156)*
vertex form of an absolute value function *Chapter 3 (p. 158)*	**vertical shrink** *Chapter 3 (p. 148)*
vertical stretch *Chapter 3 (p. 148)*	***x*-intercept** *Chapter 3 (p. 131)*

Vocabulary Flash Cards

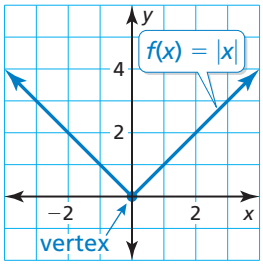
A change in the size, shape, position, or orientation of a graph

See translation, reflection, horizontal shrink, horizontal stretch, vertical shrink, and vertical stretch.

A linear equation written in the form $Ax + By = C$, where A, B, and C are real numbers and A and B are not both zero

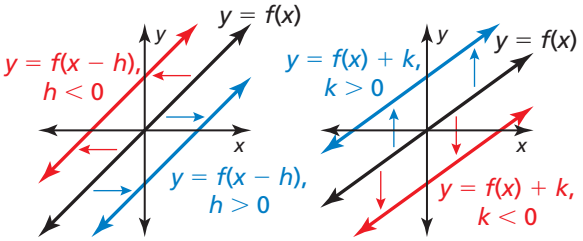
$$-2x + 3y = -6$$

The point where a graph changes direction



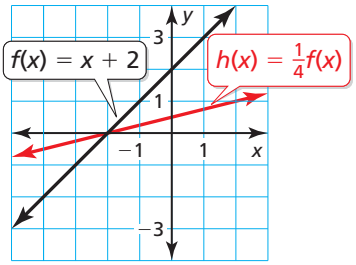
A transformation that shifts a graph horizontally and/or vertically but does not change the size, shape, or orientation of the graph

Horizontal Translations **Vertical Translations**



A transformation that causes the graph of a function to shrink toward the x-axis when all the y-coordinates are multiplied by a factor a, where $0 < a < 1$

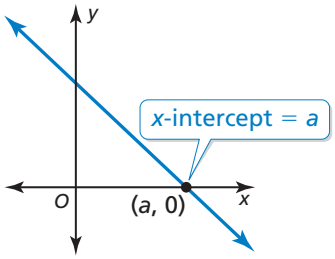
The graph of h is a vertical shrink of a graph of f by a factor of $\frac{1}{4}$.



An absolute value function written in the form $f(x) = a|x - h| + k$, where $a \neq 0$

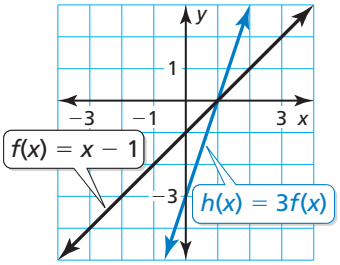
$$f(x) = |x + 1| - 2$$
$$g(x) = 2|x - 3| + 1$$

The x-coordinate of a point where the graph crosses the x-axis



A transformation that causes the graph of a function to stretch away from the x-axis when all the y-coordinates are multiplied by a factor a, where $a > 1$

The graph of h is a vertical stretch of the graph of f by a factor of 3.

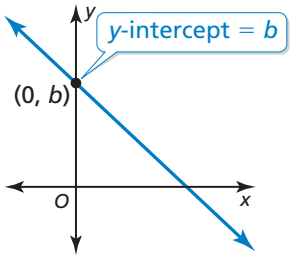


y-intercept

Chapter 3 (p. 131)

Vocabulary Flash Cards

The *y*-coordinate of a point where the graph crosses the *y*-axis



Vocabulary Flash Cards

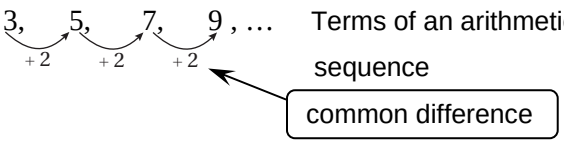
arithmetic sequence *Chapter 4 (p. 210)*	**causation** *Chapter 4 (p. 205)*
common difference *Chapter 4 (p. 210)*	**correlation** *Chapter 4 (p. 197)*
correlation coefficient *Chapter 4 (p. 203)*	**extrapolation** *Chapter 4 (p. 205)*
interpolation *Chapter 4 (p. 205)*	**line of best fit** *Chapter 4 (p. 203)*

Vocabulary Flash Cards

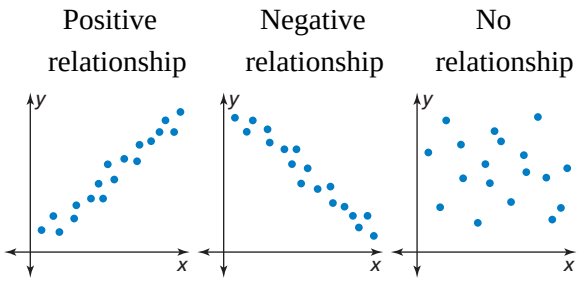
When a change in one variable causes a change in another variable

time spent exercising and the number of calories burned

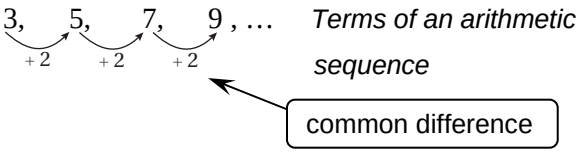
An ordered list of numbers in which the difference between each pair of consecutive terms is the same



A relationship between data sets



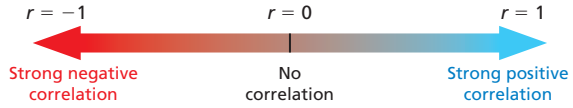
The difference between each pair of consecutive terms in an arithmetic sequence



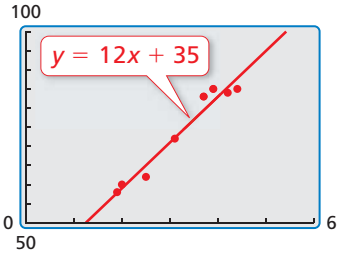
To predict a value outside the range of known values using a graph or its equation

You have a model relating age and average number of hours of sleep based on a data set where ages range from 6 to 55. Using the model to predict the average number of hours of sleep for a 5-year-old or a 57-year-old is an example of extrapolation.

A number r from –1 to 1 that tells how closely the equation of the line of best fit models the data



A line that best models a set of data



To approximate a value between two known values using a graph or its equation

You have a model relating age and average number of hours of sleep based on a data set where ages range from 6 to 55. Using the model to predict the average number of hours of sleep for a 47-year-old is an example of interpolation.

Vocabulary Flash Cards

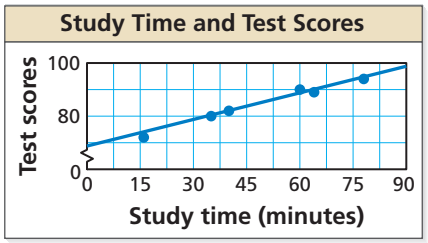
line of fit *Chapter 4 (p. 198)*	**linear model** *Chapter 4 (p. 178)*
linear regression *Chapter 4 (p. 203)*	**parallel lines** *Chapter 4 (p. 188)*
perpendicular lines *Chapter 4 (p. 189)*	**piecewise function** *Chapter 4 (p. 218)*
point-slope form *Chapter 4 (p. 182)*	**residual** *Chapter 4 (p. 202)*

Vocabulary Flash Cards

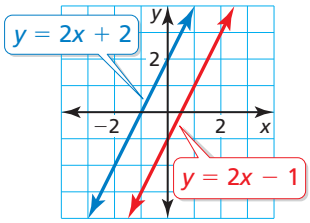
A linear function that models a real-life situation

The function $y = 0.8x + 16$ models a company's annual profits y (in millions) after x years.

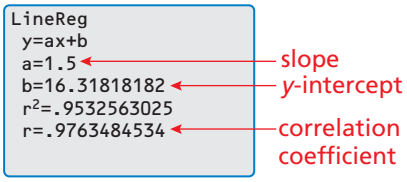
A line drawn on a scatter plot that is close to most of the data points



Two lines in the same plane that never intersect

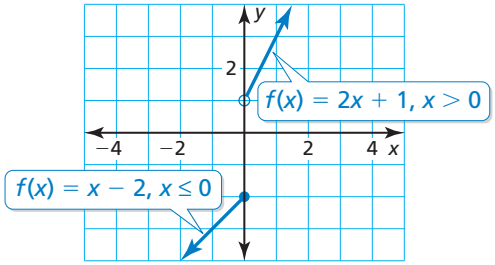


A method that graphing calculators use to find a precise line of fit that models a set of data

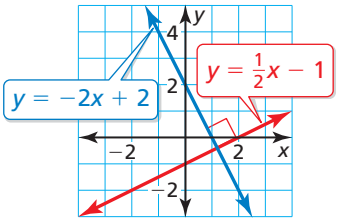


A function define by two or more equations

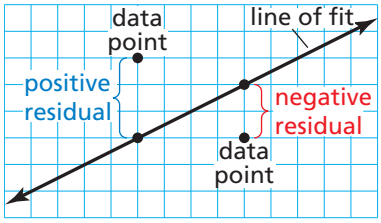
$$f(x) = \begin{cases} x - 2, & \text{if } x \le 0 \\ 2x + 1, & \text{if } x > 0 \end{cases}$$



Two lines in the same plane that intersect to form right angles



The difference of the y-value of a data point and the corresponding y-value found using the line of fit



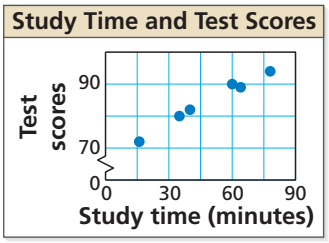
A linear equation written in the form $y - y_1 = m(x - x_1)$

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

Vocabulary Flash Cards

scatter plot *Chapter 4 (p. 196)*	**sequence** *Chapter 4 (p. 210)*
step function *Chapter 4 (p. 220)*	**terms of a sequence** *Chapter 4 (p. 210)*

Vocabulary Flash Cards

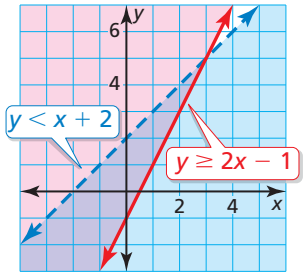
An ordered list of numbers 5, 10, 15, 20, ..., a_n, ... 2, 4, 8, 16, ..., a_n, ...	A graph that shows the relationship between two data sets 
Each number in a sequence 5, 10, 15, 20, ..., a_n, ... 1st position, 3rd position, nth position	A piecewise function defined by a constant value over each part of its domain $f(x) = \begin{cases} 50, & \text{if } 0 < x \leq 1 \\ 75, & \text{if } 1 < x \leq 2 \\ 100, & \text{if } 2 < x \leq 3 \\ 125, & \text{if } 3 < x \leq 4 \\ 150, & \text{if } 4 < x \leq 5 \end{cases}$

Vocabulary Flash Cards

graph of a linear inequality *Chapter 5 (p. 268)*	**graph of a system of linear inequalities** *Chapter 5 (p. 275)*
half-planes *Chapter 5 (p. 268)*	**linear inequality in two variables** *Chapter 5 (p. 268)*
solution of a linear inequality in two variables *Chapter 5 (p. 268)*	**solution of a system of linear equations** *Chapter 5 (p. 236)*
solution of a system of linear inequalities *Chapter 5 (p. 274)*	**system of linear equations** *Chapter 5 (p. 236)*

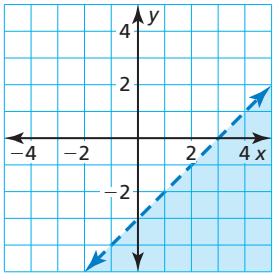
Vocabulary Flash Cards

The graph of all the solutions of the system of linear inequalities



The graph in two variables that shows all the solutions of the inequality in a coordinate plane

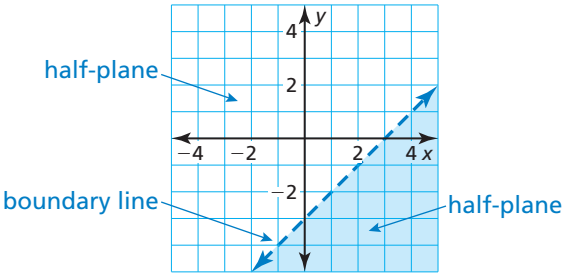
The graph of $y < x - 3$ is the shaded half-plane.



An inequality written in the form $ax + by < c$, $ax + by \leq c$, $ax + by > c$, or $ax + by \geq c$, where a, b, and c are real numbers

$$2x + y < -3$$
$$x - 3y \geq 8$$

Two regions of the coordinate plane divided by a boundary line



An ordered pair that is a solution of each equation in the system

The solution of the following system of linear equations is $(1, -3)$.

$$4x - y = 7 \quad \text{Equation 1}$$
$$2x + 3y = -7 \quad \text{Equation 2}$$

An ordered pair (x, y) that makes an inequality true

A solution of $-x + 2y > 2$ is $(2, 4)$.

A set of two or more linear equations in the same variable

$$y = x + 1 \quad \text{Equation 1}$$
$$y = 2x - 7 \quad \text{Equation 2}$$

An ordered pair that is a solution of each inequality in the system.

The solution of the following system of linear inequalities is $(-2, 5)$.

$$x - y < 4 \quad \text{Inequality 1}$$
$$2x - y \geq -9 \quad \text{Inequality 2}$$

Vocabulary Flash Cards

system of linear inequalities

Chapter 5 (p. 274)

Vocabulary Flash Cards

A set of two or more linear inequalities in the same variables

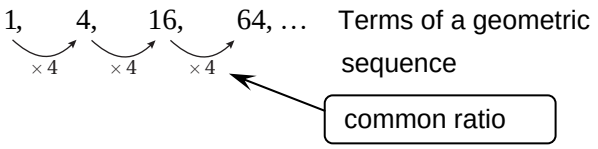
$y < x + 2$ Inequality 1

$y \geq 2x - 1$ Inequality 2

Vocabulary Flash Cards

common ratio *Chapter 6 (p. 332)*	**compound interest** *Chapter 6 (p. 317)*
explicit rule *Chapter 6 (p. 340)*	**exponential decay** *Chapter 6 (p. 315)*
exponential decay function *Chapter 6 (p. 315)*	**exponential equation** *Chapter 6 (p. 326)*
exponential function *Chapter 6 (p. 306)*	**exponential growth** *Chapter 6 (p. 314)*

Vocabulary Flash Cards

The interest earned on the principle and on previously earned interest The balance y of an account earning compound interest is $y = P\left(1 + \frac{r}{n}\right)^{nt}$, where P is the principle (initial amount), r is the annual interest rate (in decimal form), t is the time (in years), and n is the number of times interest is compounded per year.	The ratio between each pair of consecutive terms in a geometric sequence 
When a quantity decreases by the same factor over equal intervals of time *See exponential decay function.*	A rule to define arithmetic and geometric sequences that gives a_n as a function of the term's position number n in the sequence An explicit rule for the arithmetic sequence $1, 7, 13, 19, \ldots$ is $a_n = 1 + 6(n - 1)$, or $a_n = 6n - 5$.
An equation in which variable expressions occur as exponents $2^{x+1} = 2^5$ $5 = 5^{4x-7}$	A function of the form $y = a(1 - r)^t$, where $a > 0$ and $0 < r < 1$ $y = 20(0.15)^t$ $y = 500\left(\frac{7}{8}\right)^t$ *See exponential decay.*
When a quantity increases by the same factor over equal intervals of time *See exponential growth function.*	A nonlinear function of the form $y = ab^x$, where $a \neq 0$, $b \neq 1$, and $b > 0$ $y = -2(5)^x$ $y = 2(0.5)^x$

Vocabulary Flash Cards

exponential growth function *Chapter 6 (p. 314)*	**geometric sequence** *Chapter 6 (p. 332)*
index of a radical *Chapter 6 (p. 300)*	***n*th root of *a*** *Chapter 6 (p. 300)*
radical *Chapter 6 (p. 300)*	**recursive rule** *Chapter 6 (p. 340)*

Vocabulary Flash Cards

An ordered list of numbers in which the ratio between each pair of consecutive terms is the same 1, 4, 16, 64, … Terms of a geometric sequence ×4 ×4 ×4 common ratio	A function of the form $y = a(1 + r)^t$, where $a > 0$ and $r > 0$ $y = 20(1.15)^t$ $y = 500\left(\frac{7}{5}\right)^t$ *See exponential growth.*
For an integer *n* greater than 1, if $b^n = a$, then *b* is an *n*th root of *a*. $\sqrt[3]{64} = \sqrt[3]{4 \bullet 4 \bullet 4} = 4$ $\sqrt[n]{a}$ = *n*th root of *a*	The value of *n* in the radical $\sqrt[n]{a}$ The index of $\sqrt[3]{125}$ is 3.
A rule to define arithmetic and geometric sequences that gives the beginning term(s) of a sequence and a recursive equation that tells how a_n is related to one or more preceding terms $a_n = a_{n-1} + d$, where *d* is the common difference $a_1 = 2,\ a_n = a_{n-1} + 3$ $a_n = r \bullet a_{n-1}$, where *r* is the common ratio $a_1 = 1,\ a_n = 3a_{n-1}$	An expression of the form $\sqrt[n]{a}$ $\sqrt[3]{20}$ $\sqrt[4]{35}$

Vocabulary Flash Cards

binomial *Chapter 7 (p. 359)*	**closed** *Chapter 7 (p. 360)*
degree of a monomial *Chapter 7 (p. 358)*	**degree of a polynomial** *Chapter 7 (p. 359)*
factored completely *Chapter 7 (p. 404)*	**factored form** *Chapter 7 (p. 378)*
factoring by grouping *Chapter 7 (p. 404)*	**FOIL Method** *Chapter 7 (p. 367)*

Vocabulary Flash Cards

When an operation performed on any two numbers in the set results in a number that is also in the set The set of integers is closed under addition, subtraction, and multiplication, but not under division.	A polynomial with two terms $x^2 + 3x$ $2x - 1$
The greatest degree of the terms in a polynomial The degree of $6x^2 + x$ is 2. The degree of $x^5 + x^2 - 8$ is 5.	The sum of the exponents of the variables in the monomial The degree of 5 is 0. The degree of x^2 is 2. The degree of $2xy^3$ is $1 + 3 = 4$.
A polynomial that is written as a product of factors $x^2 + 2x = x(x + 2)$ $x^2 + 5x - 24 = (x - 3)(x + 8)$	A polynomial that is written as a product of unfactorable polynomials with integer coefficients $3x^3 - 18x^2 + 24x = 3x(x^2 - 6x + 8)$ $= 3x(x - 2)(x - 4)$
A shortcut for multiplying two binomials by finding the sum of the products of the first terms, outer terms, inner terms, and last terms F $(\mathbf{x} + 1)(\mathbf{x} + 2) \Rightarrow x(x) = x^2$ O $(\mathbf{x} + 1)(x + \mathbf{2}) \Rightarrow x(2) = 2x$ I $(x + \mathbf{1})(\mathbf{x} + 2) \Rightarrow 1(x) = x$ L $(x + \mathbf{1})(x + \mathbf{2}) \Rightarrow 1(2) = 2$	To use the Distributive Property to factor a polynomial with four terms $x^3 + 3x^2 + 2x + 6 = (x^3 + 3x^2) + (2x + 6)$ $= x^2(x + 3) + 2(x + 3)$ $= (x + 3)(x^2 + 2)$

Vocabulary Flash Cards

leading coefficient *Chapter 7 (p. 359)*	**monomial** *Chapter 7 (p. 358)*
polynomial *Chapter 7 (p. 359)*	**repeated roots** *Chapter 7 (p. 379)*
roots *Chapter 7 (p. 378)*	**standard form of a polynomial** *Chapter 7 (p. 359)*
trinomial *Chapter 7 (p. 359)*	**Zero-Product Property** *Chapter 7 (p. 378)*

Vocabulary Flash Cards

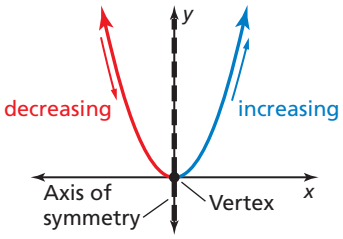
A number, a variable, or a product of a number and one or more variables with whole number exponents -5 $0.5y^2$ $4x^2y$	The coefficient of the first term of the polynomial written in standard form The leading coefficient of $3x^2 + 5x - 1$ is 3.
Two or more roots of an equation that are the same number The equation $(x + 2)^2 = 0$ has repeated roots of $x = -2$.	A monomial or a sum of monomials $5x + 2$ $x^2 + 5x + 2$
A polynomial in one variable written with the exponents of the terms decreasing form left to right $2x^3 + x^2 - 5x + 12$ $-x^3 + 15x + 3$	The solution of a polynomial equation The roots of the equation $(x + 9)(x - 4) = 0$ are $x = -9$ and $x = 4$.
If the product of two real numbers is 0, then at least one of the numbers is 0. $(x + 6)(x - 5) = 0$ $x + 6 = 0$ *or* $x - 5 = 0$ $x = -6$ *or* $x = 5$	A polynomial with three terms $x^2 + 5x + 2$

Vocabulary Flash Cards

average rate of change *Chapter 8 (p. 462)*	**axis of symmetry** *Chapter 8 (p. 420)*
even function *Chapter 8 (p. 442)*	**intercept form** *Chapter 8 (p. 450)*
maximum value *Chapter 8 (p. 433)*	**minimum value** *Chapter 8 (p. 433)*
odd function *Chapter 8 (p. 442)*	**parabola** *Chapter 8 (p. 420)*

Vocabulary Flash Cards

The vertical line that divides a parabola into two symmetric parts



The slope of the line through $(a, f(a))$ and $(b, f(b))$ of a function $y = f(x)$ between $x = a$ and $x = b$

$$\text{average rate of change} = \frac{\text{change in } y}{\text{change in } x} = \frac{f(b) - f(a)}{b - a}$$

A quadratic function written in the form $f(x) = a(x - p)(x - q)$, where $a \neq 0$

$f(x) = 2(x - 3)(x - 1)$

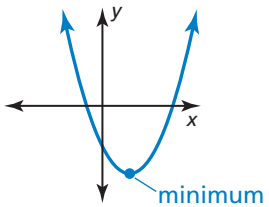
$f(x) = 3(x + 4)(x - 2)$

A function $y = f(x)$ is even when $f(-x) = f(x)$ for each x in the domain of f.

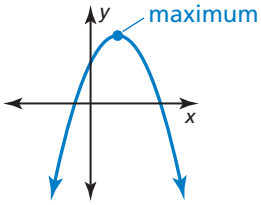
$f(x) = x^2$

$f(x) = 3x^4 - 2x^2$

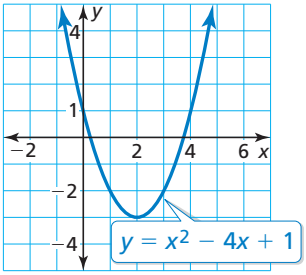
The y-coordinate of the vertex of the graph of $f(x) = ax^2 + bx + c$ when $a > 0$



The y-coordinate of the vertex of the graph of $f(x) = ax^2 + bx + c$ when $a < 0$



The U-shaped graph of a quadratic function



A function $y = f(x)$ is odd when $f(-x) = -f(x)$ for each x in the domain of f.

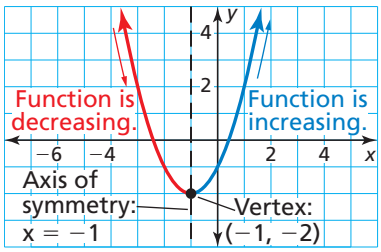
$f(x) = x^3$

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

Vocabulary Flash Cards

vertex form of a quadratic function *Chapter 8 (p. 444)*	**vertex of a parabola** *Chapter 8 (p. 420)*
zero of a function *Chapter 8 (p. 428)*	

Vocabulary Flash Cards

The lowest point on a parabola that opens up or the highest point on a parabola that opens down  	A quadratic function written in the form $f(x) = a(x - h)^2 + k$, where $a \neq 0$ $y = (x - 2)^2$ $y = -2(x + 4)^2 + 3$
	An x-value of a function f for which $f(x) = 0$; an x-intercept of the graph of the function The zero of $f(x) = 2x - 6$ is 3 because $f(3) = 0$ and 3 is the x-intercept of the graph of the function.

Vocabulary Flash Cards

completing the square *Chapter 9 (p. 506)*	**conjugates** *Chapter 9 (p. 482)*
counterexample *Chapter 9 (p. 479)*	**discriminant** *Chapter 9 (p. 518)*
like radicals *Chapter 9 (p. 484)*	**quadratic equation** *Chapter 9 (p. 490)*
Quadratic Formula *Chapter 9 (p. 516)*	**quadratic function** *Chapter 9 (p. 420)*

Vocabulary Flash Cards

Binomials of the form $a\sqrt{b} + c\sqrt{d}$ and $a\sqrt{b} - c\sqrt{d}$, where *a*, *b*, *c*, and *d* are rational numbers $6\sqrt{5} + 2\sqrt{3}$ and $6\sqrt{5} - 2\sqrt{3}$	To add a constant *c* to an expression of the form $x^2 + bx$ so that $x^2 + bx + c$ is a perfect square trinomial $x^2 + 6x + 9 = (x + 3)^2$ $x^2 + bx + \left(\frac{b}{2}\right)^2 = \left(x + \frac{b}{2}\right)^2$
The expression under the radical symbol, $b^2 - 4ac$, in the Quadratic Formula The value of the discriminant of the equation $3x^2 - 2x - 7 = 0$ is $b^2 - 4ac = (-2)^2 - 4(3)(-7) = 88.$	An example that proves that a general statement is not true *Conjecture*: Every whole number ending in 6 evenly divides 3. *Counterexample*: 16 does not evenly divide 3.
A nonlinear equation that can be written in the standard form $ax^2 + bx + c = 0$, where $a \neq 0$ $x^2 + 4x = 12$ $-x^2 + 1 = 2x$	Radicals with the same index and radicand $3\sqrt{11}$ and $5\sqrt{11}$ $4\sqrt[3]{x}$ and $5\sqrt[3]{x}$
A nonlinear function that can be written in the standard form $y = ax^2 + bx + c$, where $a \neq 0$ $y = -16x^2 + 48x + 6$	The real solutions of the quadratic equation $ax^2 + bx + c = 0$ are $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, where $a \neq 0$ and $b^2 - 4ac \geq 0$. To solve $2x^2 + 13x - 7 = 0$, substitute 2 for *a*, 13 for *b*, and –7 for *c* in the Quadratic Formula. $x = \frac{-13 \pm \sqrt{13^2 - 4(2)(-7)}}{2(2)} \rightarrow x = \frac{1}{2}$ and $x = -7$

Vocabulary Flash Cards

radical expression *Chapter 9 (p. 480)*	**rationalizing the denominator** *Chapter 9 (p. 482)*
simplest form *Chapter 9 (p. 480)*	**system of nonlinear equations** *Chapter 9 (p. 526)*

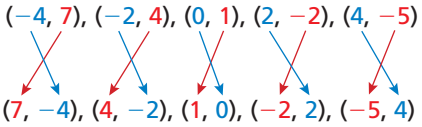
Vocabulary Flash Cards

To eliminate a radical from the denominator of a fraction by multiplying by an appropriate form of 1 $\frac{1}{\sqrt{10}} = \frac{1}{\sqrt{10}} \bullet \frac{\sqrt{10}}{\sqrt{10}} = \frac{\sqrt{10}}{\sqrt{100}} = \frac{\sqrt{10}}{10}$ $\frac{\sqrt{2}}{\sqrt{3n}} = \frac{\sqrt{2}}{\sqrt{3n}} \bullet \frac{\sqrt{3n}}{\sqrt{3n}} = \frac{\sqrt{6n}}{\sqrt{9n^2}} = \frac{\sqrt{6n}}{3n}$	An expression that contains a radical $\sqrt{50} - 2$ $\sqrt{64x^3}$
A system in which at least one of the equations is nonlinear $y = 2x^2 + 5x - 1$ Equation 1 $y = x - 3$ Equation 2	A radical that has no radicands with perfect *n*th powers as factors other than 1, no radicands that contain fractions, and no radicals that appear in the denominator of a fraction $\sqrt{27} = 3\sqrt{3}$ $\frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

Vocabulary Flash Cards

cube root function *Chapter 10 (p. 552)*	**inverse function** *Chapter 10 (p. 569)*
inverse relation *Chapter 10 (p. 568)*	**radical equation** *Chapter 10 (p. 560)*
radical function *Chapter 10 (p. 545)*	**square root function** *Chapter 10 (p. 544)*

Vocabulary Flash Cards

Functions that undo each other $f(x) = 2x - 5$ and $g(x) = \frac{1}{2}x + \frac{5}{2}$	A radical function with an index of 3 $y = 5\sqrt[3]{x - 6}$ $y = -\sqrt[3]{x + 2} - 8$
An equation that contains a radical expression with a variable in the radicand $\sqrt{x} + 6 = 12$ $4 - 2\sqrt{x} = 0$ $\sqrt{3x - 1} = \sqrt{x + 4}$	When the input and output values of the original relation are switched 
A function that contains a square root with the independent variable in the radicand $f(x) = 3\sqrt{x - 5}$ $f(x) = -\sqrt{x + 1} + 2$	A function that contains a radical expression with the independent variable in the radicand $g(x) = \sqrt{x} - 5$ $h(x) = \sqrt{3x + 6}$

Vocabulary Flash Cards

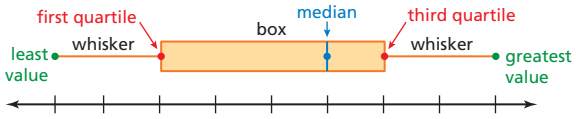
box-and-whisker plot *Chapter 11 (p. 594)*	**categorical data** *Chapter 11 (p. 618)*
conditional relative frequency *Chapter 11 (p. 612)*	**data transformation** *Chapter 11 (p. 589)*
five-number summary *Chapter 11 (p. 594)*	**interquartile range** *Chapter 11 (p. 595)*
joint frequency *Chapter 11 (p. 610)*	**joint relative frequency** *Chapter 11 (p. 611)*

Vocabulary Flash Cards

Data that consists of labels or nonnumerical entries that can be separated into different categories; also known as qualitative data

Data Source	Qualitative Data
a student	What is your favorite subject? *math*
a house	In what state is the house located? *Wisconsin*

A graph that shows the variability of a data set along a number line using the least value, the greatest value, and the quartiles of the data



A procedure that uses a mathematical operation to change a data set into a different data set

Adding 5 to each value in the data set

$$-2,\ 0,\ 1,\ 4,\ 5,\ 16$$

transforms the data set into

$$3,\ 5,\ 6,\ 9,\ 10,\ 21.$$

The ratio of a joint relative frequency to the marginal relative frequency

		Major in Medical Field	
		Yes	No
Class	Junior	$\frac{0.18}{0.33} \approx 0.55$	$\frac{0.32}{0.67} \approx 0.48$
	Senior	$\frac{0.15}{0.33} \approx 0.45$	$\frac{0.35}{0.67} \approx 0.52$

Given that a student is not planning to major in a medical field, the conditional relative frequency that he or she is a junior is about 48%.

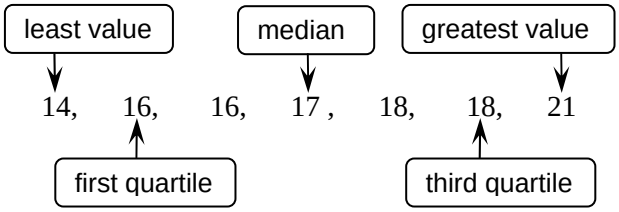
A measure of variation for a data set, which is the difference of the third quartile and the first quartile

The interquartile range of the data set is $42 - 18 = 24$.

first quartile third quartile

15, **18**, 21, 28, 35, **42**, 55

The five numbers that make up a box-and-whisker plot (least value, first quartile, median, third quartile, and greatest value)



See box-and-whisker plot.

The ratio of a frequency that is not in the "total" row or the "total" column to the number of values or observations

		Major in Medical Field		
		Yes	No	Total
Class	Junior	$\frac{124}{680} \approx 0.18$	$\frac{219}{680} \approx 0.32$	0.50
	Senior	$\frac{101}{680} \approx 0.15$	$\frac{236}{680} \approx 0.35$	0.50
	Total	0.33	0.67	1

joint relative frequency

Each entry in a two-way table

		Student	
		Studied	Did Not Study
Grade	Passed	21	2
	Failed	1	6

joint frequency

Vocabulary Flash Cards

marginal frequency *Chapter 11 (p. 610)*	**marginal relative frequency** *Chapter 11 (p. 611)*
mean *Chapter 11 (p. 586)*	**measure of center** *Chapter 11 (p. 586)*
measure of variation *Chapter 11 (p. 587)*	**median** *Chapter 11 (p. 586)*
misleading graph *Chapter 11 (p. 620)*	**mode** *Chapter 11 (p. 586)*

Vocabulary Flash Cards

The sum of the joint relative frequencies in a row or a column

		Major in Medical Field		
		Yes	No	Total
Class	Junior	$\frac{124}{680} \approx 0.18$	$\frac{219}{680} \approx 0.32$	0.50
	Senior	$\frac{101}{680} \approx 0.15$	$\frac{236}{680} \approx 0.35$	0.50
	Total	0.33	0.67	1

marginal relative frequency

The sums of the rows and columns in a two-way table

		Age			
		12–13	14–15	16–17	Total
Student	Ride Bus	24	12	14	50
	Does Not Ride Bus	16	13	21	50
	Total	40	25	35	100

marginal frequency

A measure that represents the center, or typical value, of a data set

The mean, median, and mode are measures of center.

The sum of a numerical data set divided by the number of data values

The mean of the values 7, 4, 8, and 9 is

$$\frac{7 + 4 + 8 + 9}{4} = \frac{28}{4} = 7.$$

The middle number of a numerical data set when the values are written in numerical order

The median of the data set 24, 25, 29, 33, 38 is 29.

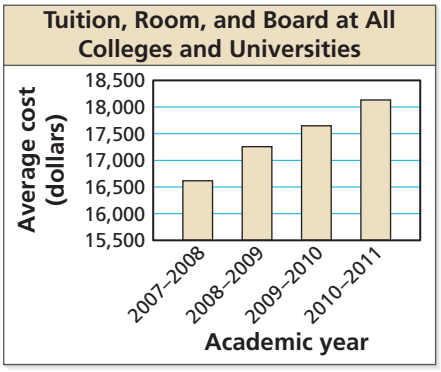
A measure that describes the spread, or distribution, of a data set

The range and standard deviation are measures of variation.

The value or values that occur most often in a data set

The mode of the data set 3, 4, 4, 7, 7, 9, 12 are 4 and 7.

A statistical graph that is not drawn appropriately



Vocabulary Flash Cards

outlier *Chapter 11 (p. 587)*	**qualitative data** *Chapter 11 (p. 618)*
quantitative data *Chapter 11 (p. 618)*	**quartiles** *Chapter 11 (p. 594)*
range of a data set *Chapter 11 (p. 587)*	**standard deviation** *Chapter 11 (p. 588)*
two-way table *Chapter 11 (p. 610)*	

Vocabulary Flash Cards

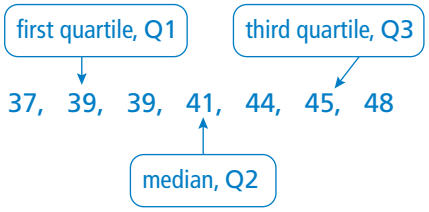
Data that consists of labels or nonnumerical entries that can be separated into different categories

Data Source	Qualitative Data
a student	What is your favorite subject? *math*
a house	In what state is the house located? *Wisconsin*

A data value that is much greater than or much less than the other values in a data set

In the data set 2, 4, 4, 5, 6, 64, the data value 64 is an outlier.

Values of a box-and-whisker plot that divide a data set into four equal parts



Data that consist of numbers that represent counts or measurements

Data Source	Quantitative Data
a student	What is your age? *15*
a house	How many bedrooms? *3*

A measure of how much a typical value in a numerical data set differs from the mean

The standard deviation is given by

$$\sigma = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \cdots + (x_n - \bar{x})^2}{n}}$$

where n is the number of values in the data set.

The difference of the greatest value and the least value of a data set

The range of the data set 12, 16, 18, 22, 27, 35 is $35 - 12 = 23$.

A frequency table that displays data collected from one source that belong to two different categories

		Fundraiser	
		No	Yes
Gender	Female	22	51
	Male	30	29

Vocabulary Flash Cards