

# Secondary 1

## Vocabulary Cards and Word Walls

Revised: June 27, 2012

### Important Notes for Teachers:

- The vocabulary cards in this file match the Common Core, the math curriculum adopted by the Utah State Board of Education, August 2010.
- The cards are arranged alphabetically.
- Each card has three sections.
  - Section 1 is only the word. This is to be used as a visual aid in spelling and pronunciation. It is also used when students are writing their own “kid-friendly” definition and drawing their own graphic.
  - Section 2 has the word and a graphic. This graphic is available to be used as a model by the teacher.
  - Section 3 has the word, a graphic, and a definition. This is to be used for the Word Wall in the classroom. For more information on using a Word Wall for Daily Review – see “Vocabulary – Word Wall Ideas” on this website.
- These cards are designed to help all students with math content vocabulary, including ELL, Gifted and Talented, Special Education, and Regular Education students.

For possible additions or corrections to the vocabulary cards, please contact the Granite School District Math Department at 385-646-4239.

#### Bibliography of Definition Sources:

Algebra 1 Common Core, Pearson, 2012, ISBN -13: 978-0-133-18549-2

Geometry Common Core, Pearson, 2012, ISBN -13: 978-0-133-18583-6

Algebra to Go, Great Source, 2000. ISBN 0-669-46151-8

Math on Call, Great Source, 2004. ISBN-13: 978-0-669-50819-2

Math at Hand, Great Source, 1999. ISBN 0-669-46922

Math to Know, Great Source, 2000. ISBN 0-669-47153-4

Illustrated Dictionary of Math, Usborne Publishing Ltd., 2003. ISBN 0-7945-0662-3

Math Dictionary, Eula Ewing Monroe, Boyds Mills Press, 2006. ISBN-13: 978-1-59078-413-6

Student Reference Books, Everyday Mathematics, 2007.

Houghton-Mifflin eGlossary, <http://www.eduplace.com>

Interactive Math Dictionary, <http://www.amathsdictionaryforkids.com/>

# marginal frequency

## marginal frequency

	Dance	Sports	Movies	TOTAL
Women	16	6	8	<b>30</b>
Men	2	10	8	<b>20</b>
TOTAL	<b>18</b>	<b>16</b>	<b>16</b>	50

## marginal frequency

	Dance	Sports	Movies	TOTAL
Women	16	6	8	<b>30</b>
Men	2	10	8	<b>20</b>
TOTAL	<b>18</b>	<b>16</b>	<b>16</b>	50

The total row and total column report the marginal frequencies or marginal distribution.

# mean

**Data Set: 14, 21, 27, 33, 45, 46, 52**

**Step 1:**

$$14 + 21 + 27 + 33 + 45 + 46 + 52 = 238$$

**Step 2:**

$$238 \div 7 = 34 \leftarrow \text{mean}$$

# mean

**Data Set: 14, 21, 27, 33, 45, 46, 52**

**Step 1:**

$$14 + 21 + 27 + 33 + 45 + 46 + 52 = 238$$

**Step 2:**

$$238 \div 7 = 34 \leftarrow \text{mean}$$

# mean

The sum of a set of numbers divided by the number of elements in the set. (A type of average)

# median

14, 21, 27, **33**, 45, 46, 52



median

# median

14, 21, 27, **33**, 45, 46, 52



median

The middle number of a set of numbers when the numbers are arranged from least to greatest, or the mean of two middle numbers when the set has two middle numbers.

# median

# numerical (quantitative) data

Counting the number of students getting on a school.



# numerical (quantitative) data

Counting the number of  
students getting on a school.



Numerical/quantitative data are  
numbers in context.

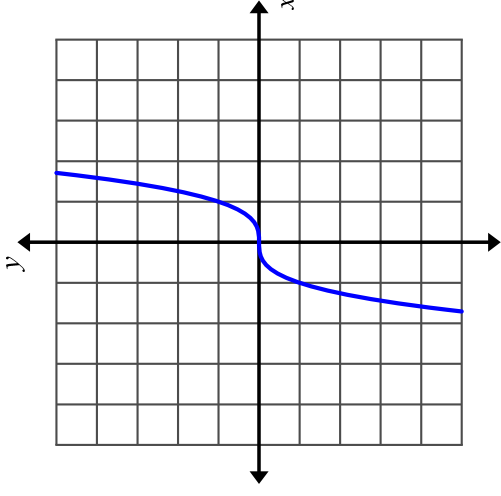
Examples:

- 'there are 43 flies on the ceiling'
- 'there are 5 pieces of gum in a pack'
- 'there are 8 planets in the solar system'

# numerical (quantitative) data

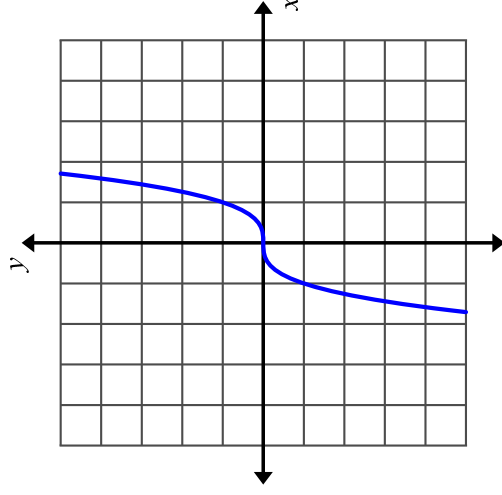
# odd function

## odd function



$h(x) = x^3$  is an example of an odd function.

Notice that if you rotate the graph  $180^\circ$  around the origin, it will match up with itself.



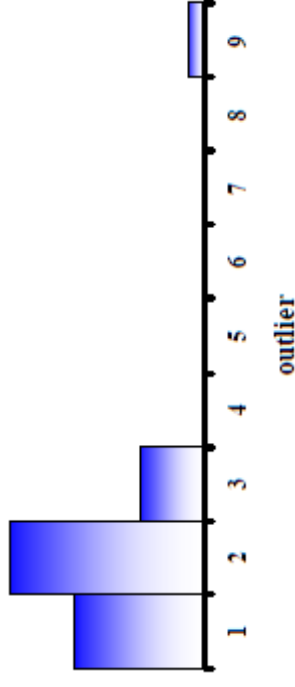
## odd function

A function is odd if  $-f(x) = f(-x)$  for all  $x$  in the domain of the function, or  $-f(x) + f(-x) = 0$ .

Geometrically, the graph of an odd function has rotational symmetry with respect to the origin.

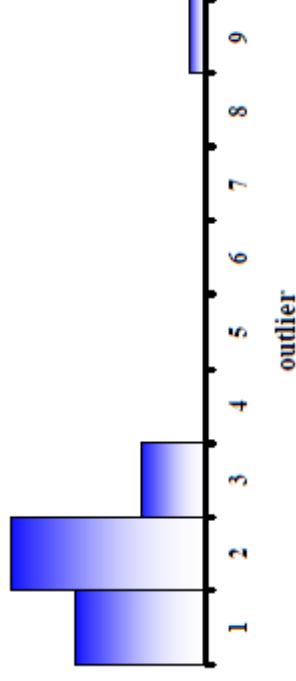
# outlier

Looking back at Bob's points scored, any outliers lie outside the interval (3.25, 17.25).



# outlier

Looking back at Bob's points scored, any outliers lie outside the interval (3.25, 17.25).



Extreme values that differ greatly from the other observations.

As a rule, an extreme value is considered to be an outlier if it is at least 1.5 *interquartile ranges* below the lower quartile (Q1), or at least 1.5 *interquartile ranges* above the upper quartile (Q3).

# outlier

# output

$$f(x) = 2(x + 1) - 7$$

input:  $x = 3$

$$\begin{aligned} f(3) &= 2(3 + 1) - 7 \\ &= 2(4) - 7 \\ &= 8 - 7 \end{aligned}$$

**= 1**

**output is 1**

# output

$$f(x) = 2(x + 1) - 7$$

input:  $x = 3$

$$\begin{aligned} f(3) &= 2(3 + 1) - 7 \\ &= 2(4) - 7 \\ &= 8 - 7 \end{aligned}$$

**= 1**

**output is 1**

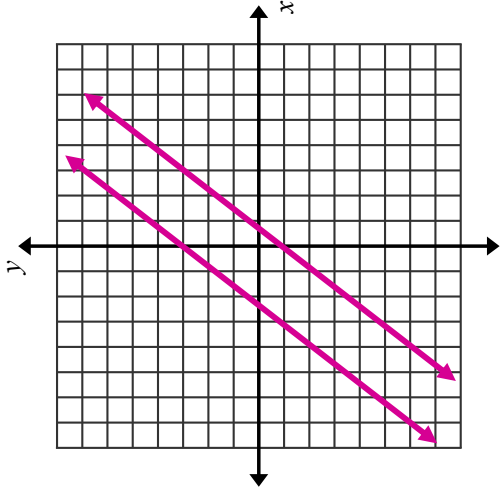
A value of the dependent variable.

# output

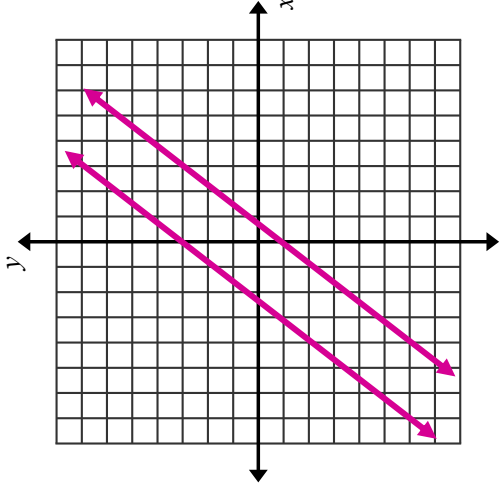


# parallel lines

## parallel lines



## parallel lines

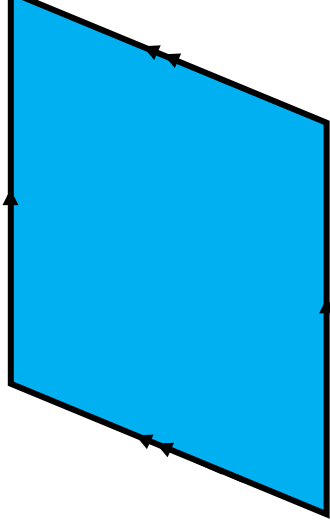


Two lines in the same plane that never intersect. Parallel lines have the same slope.

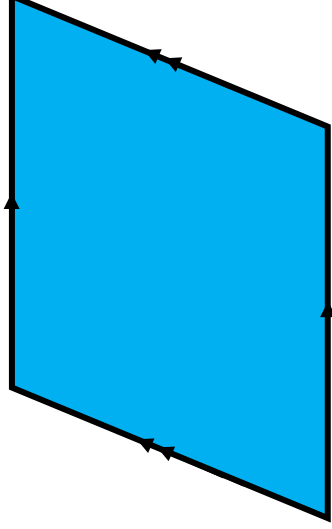
# parallelogram

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parallelogram

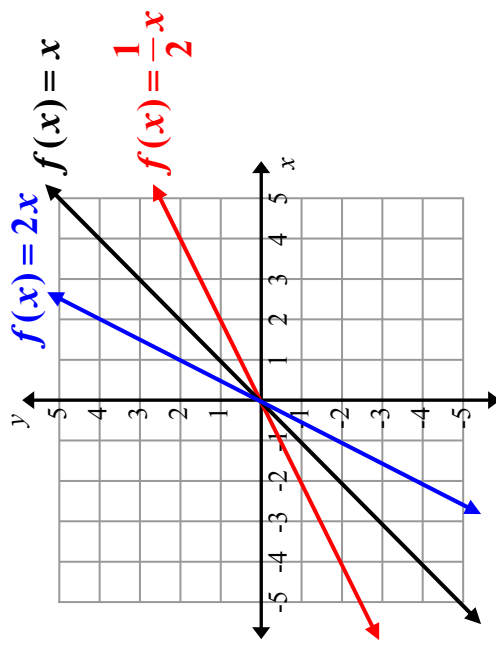


parallelogram

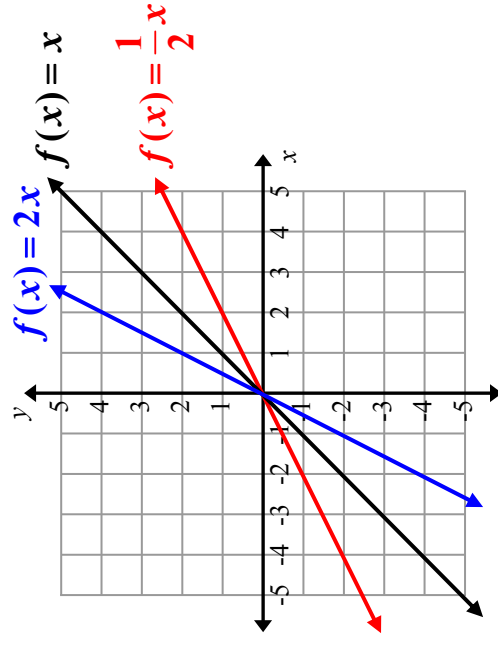


A quadrilateral with two pairs of parallel and congruent sides.

# parameter



# parameter

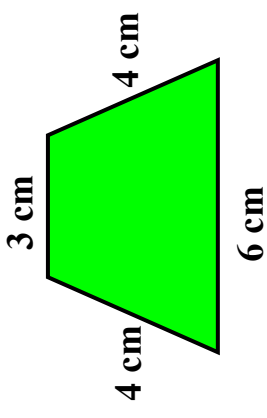


A constant or variable term in a function that determines the specific form of the function but not its general nature, as  $a$  in  $f(x) = ax$ , where  $a$  determines only the slope of the line described by  $f(x)$ .

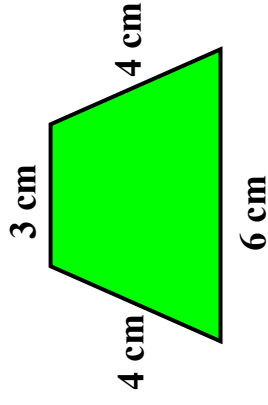
# parameter

# perimeter

## perimeter



$$\begin{aligned} \text{Perimeter} &= 4\text{cm} + 6\text{cm} + 4\text{cm} + 3\text{cm} \\ &= 17\text{cm} \end{aligned}$$



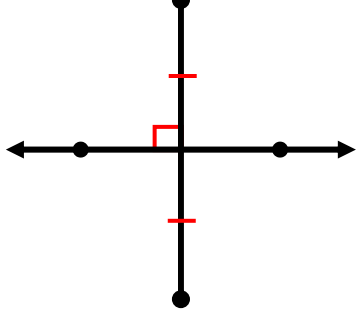
$$\begin{aligned} \text{Perimeter} &= 4\text{cm} + 6\text{cm} + 4\text{cm} + 3\text{cm} \\ &= 17\text{cm} \end{aligned}$$

The continuous line forming the boundary of a closed geometric figure.

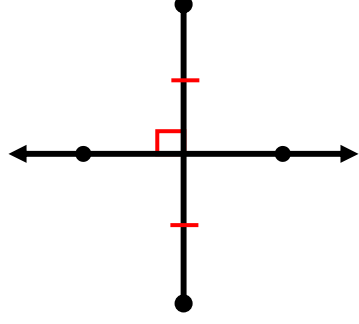
## perimeter

# perpendicular bisector of a segment

perpendicular  
bisector  
of a segment



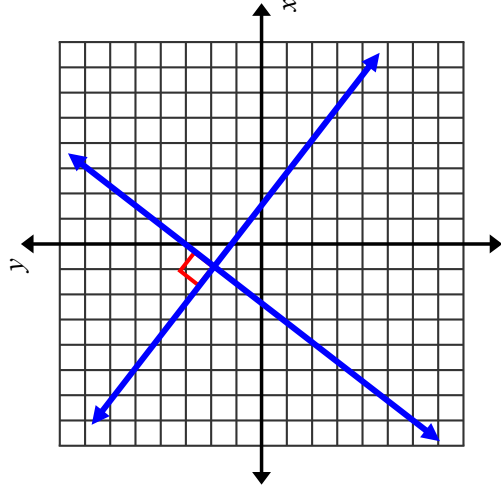
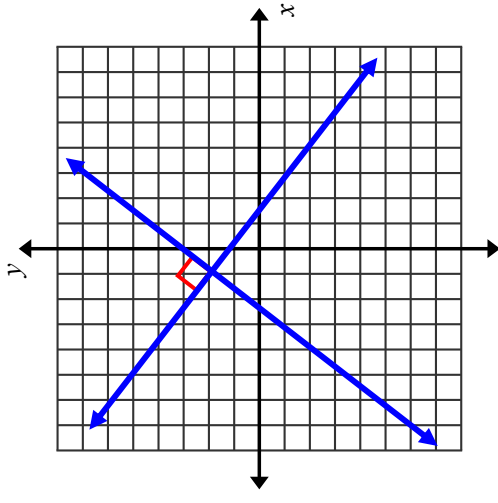
perpendicular  
bisector  
of a segment



A line, segment, or ray that  
is perpendicular to the  
segment at its midpoint.

# perpendicular lines

## perpendicular lines



## perpendicular lines

Lines that intersect to form right angles. Two lines are perpendicular if the product of their slopes is  $-1$ .

# point

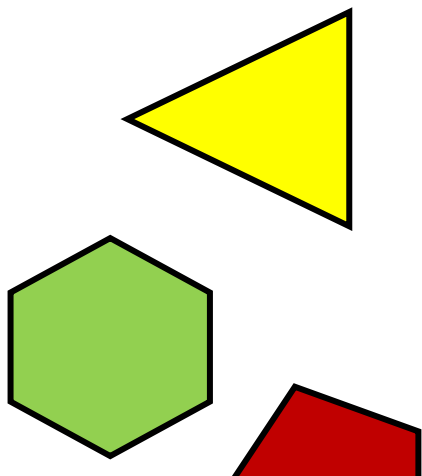
## point



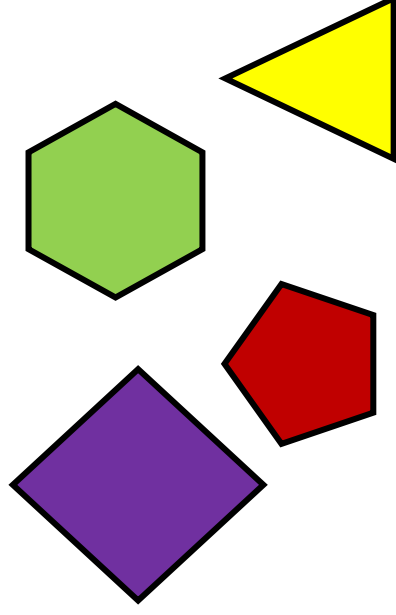
In Euclidean geometry, a point is undefined. You can think of a point as a location. A point has no size.

## point

# **polygon**



# **polygon**



A closed figure formed from  
line segments that meet only at  
their endpoints.

# **polygon**



# Pythagorean Theorem

$$a^2 + b^2 = c^2$$

$$a = 3$$

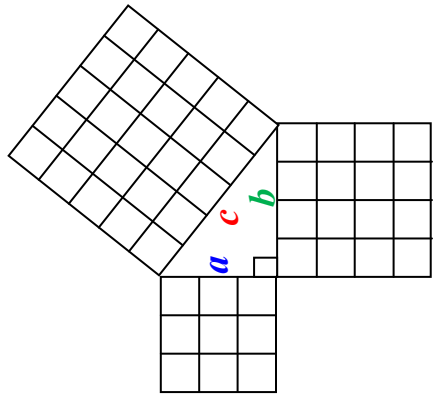
$$b = 4$$

$$c = 5$$

$$3^2 + 4^2 = 5^2$$

$$9 + 16 = 25$$

## Pythagorean Theorem



$$a^2 + b^2 = c^2$$

$$a = 3$$

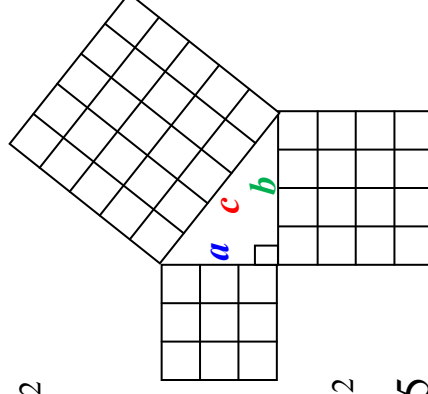
$$b = 4$$

$$c = 5$$

$$3^2 + 4^2 = 5^2$$

$$9 + 16 = 25$$

## Pythagorean Theorem



In any right triangle, the sum of the squares of the length of legs ( $a$  and  $b$ ) is equal to the square of the length of the hypotenuse  $c$ .

# quartile

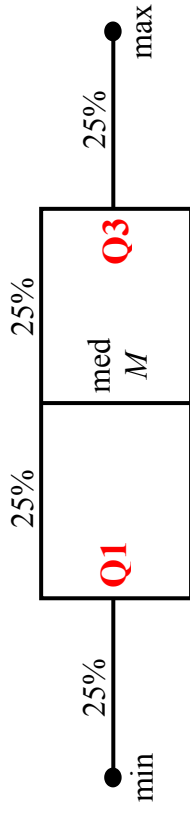
first quartile (Q1)

third quartile (Q3)

# quartile

first quartile (Q1)

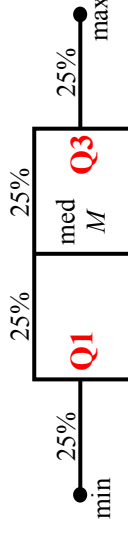
third quartile (Q3)



# quartile

first quartile (Q1)

third quartile (Q3)

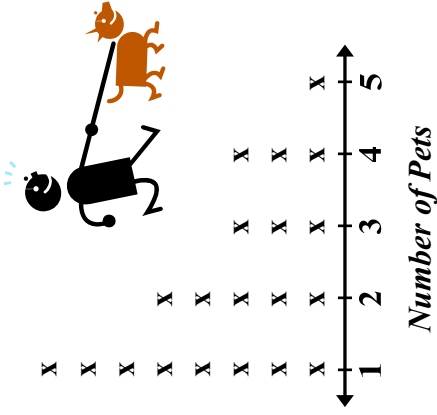


For a data set with median  $M$ , the first quartile is the median of the data values less than  $M$ .

For a data set with median  $M$ , the third quartile is the median of the data values greater than  $M$ .

# range

(statistics)

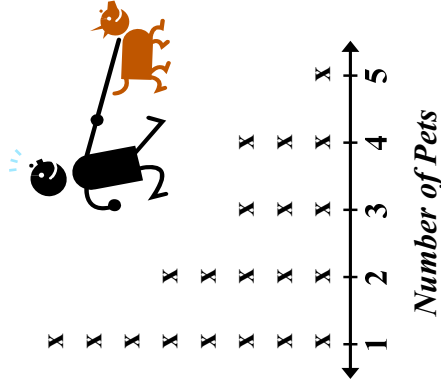


$$5 - 1 = 4$$

Range is 4.

# range

(statistics)



$$5 - 1 = 4$$

Range is 4.

The difference between the greatest number and the least number in a set of numbers.

# range

(statistics)

# range

## range

$\{(2, -3), (4, 6), (3, -1), (7, 6), (6, 3)\}$

range:  $\{-3, 6, -1, 6, 3\}$

## range

$\{(2, -3), (4, 6), (3, -1), (7, 6), (6, 3)\}$

range:  $\{-3, 6, -1, 6, 3\}$

The set of “output” values for which a function is defined.

# rate of change

## rate of change

Input	Output
1	25
3	75
5	125
7	175
9	225

$$\frac{\text{Change in the output}}{\text{Change in the input}} = \frac{125 - 75}{5 - 3} = \frac{50}{2} = 25$$

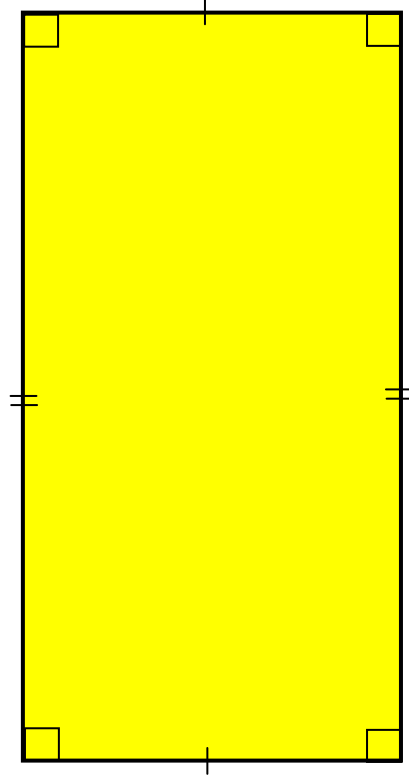
## rate of change

Input	Output
1	25
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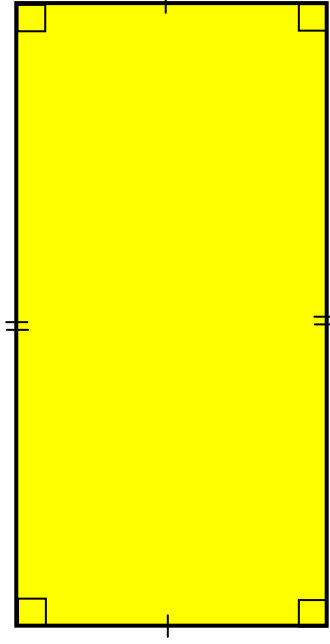
$$\frac{\text{Change in the output}}{\text{Change in the input}} = \frac{125 - 75}{5 - 3} = \frac{50}{2} = 25$$

The ratio of the change in the output value and change in the input value of a function.

# rectangle



# rectangle



A quadrilateral with two  
pairs of congruent,  
parallel sides and four  
right angles.

# rectangle

# recursive

2, 5, 8, 11, 14...

$$a_n = a_{n-1} + d$$

$$a_n = a_{n-1} + 3$$

# recursive

2, 5, 8, 11, 14...

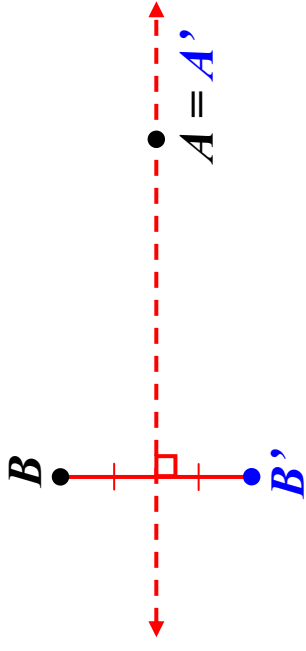
$$a_n = a_{n-1} + d$$

$$a_n = a_{n-1} + 3$$

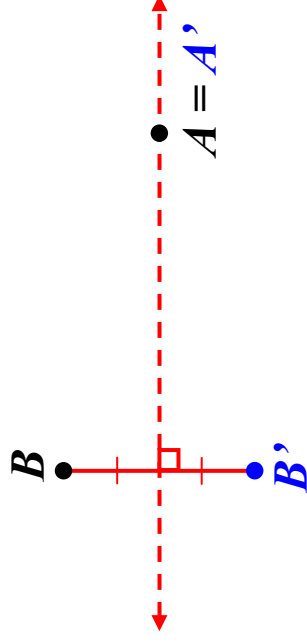
Pertaining to or using a rule or procedure that can be applied repeatedly.

# recursive

# reflection



# reflection



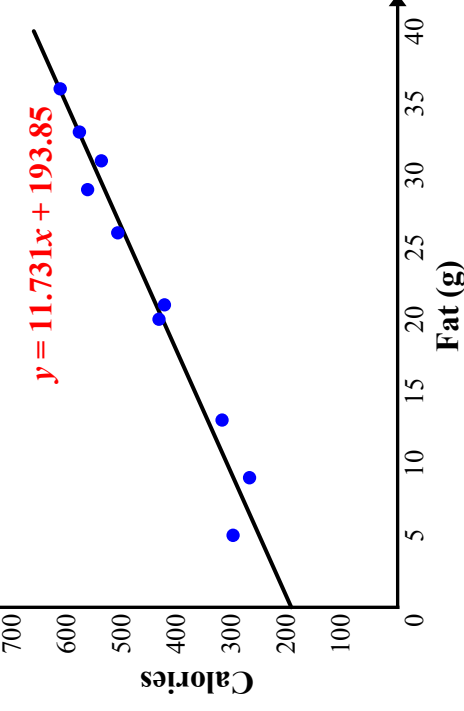
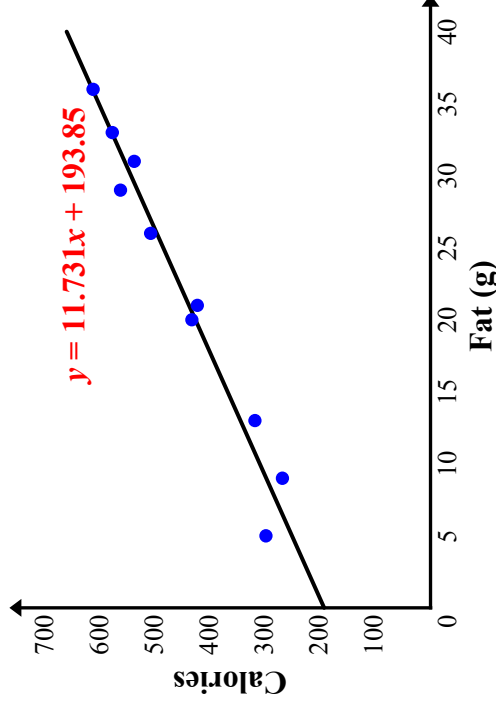
# reflection

A transformation such that if a point  $A$  is on line  $r$ , then the image of  $A$  is itself, and if a point  $B$  is not on line  $r$ , then its image  $B'$  is the point such that  $r$  is the perpendicular bisector of  $\overline{BB'}$ .



# regression equation

## regression equation

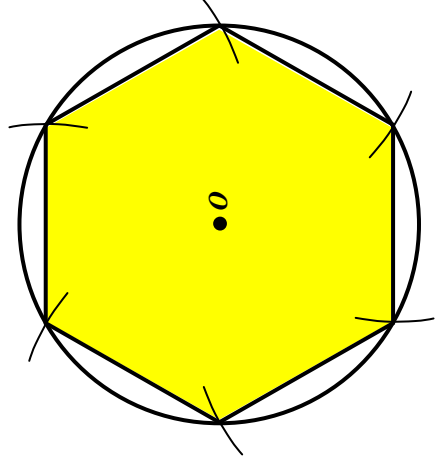


The equation representing the relation between selected values of one variable ( $x$ ) and observed values of the other ( $y$ ); it permits the prediction of the most probable values of  $y$ .

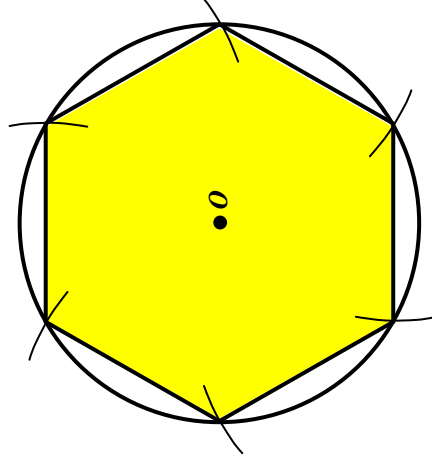
## regression equation

# regular hexagon in a circle

regular  
hexagon in a  
circle



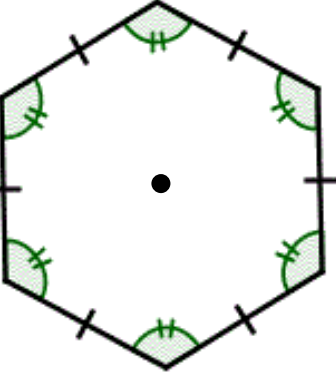
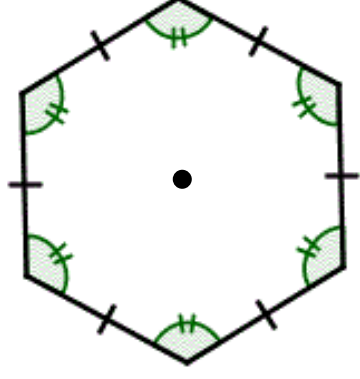
regular  
hexagon in a  
circle



A regular hexagon that has  
been inscribed in a circle.

# regular polygon

regular  
polygon

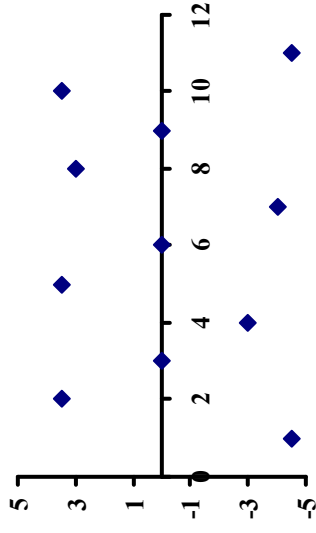


regular  
polygon

A polygon that is both equilateral and equiangular. Its center is the point that is equidistant from its vertices.

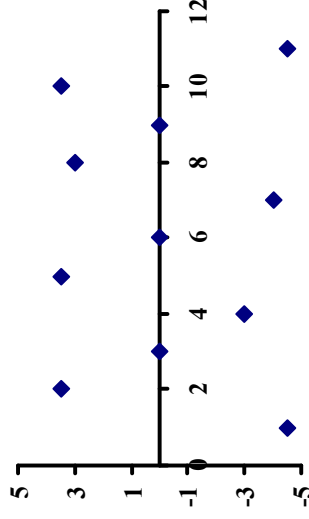
# residuals

The residual plot shows a random pattern indicating a good fit for a linear model.



# residuals

The residual plot shows a random pattern indicating a good fit for a linear model.



Residual (or error) represents unexplained variation after fitting a regression model. The difference between the observed value of the dependent variable ( $y$ ) and the predicted value ( $\hat{y}$ ) is called the **residual** ( $e$ ).

$$e = y - \hat{y}$$

# residuals

# rigid motion

translation  
translation

reflection

reflection

rotation  
rotation

# rigid motion

translation  
translation

reflection

reflection

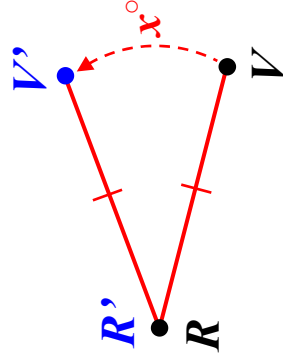
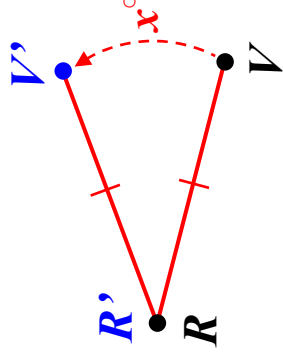
rotation  
rotation

A transformation in the plane that preserves distance and angle measure.

# rigid motion

# rotation

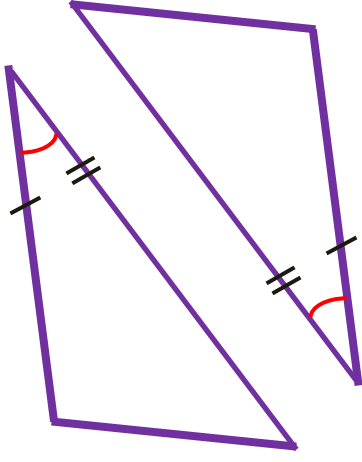
## rotation



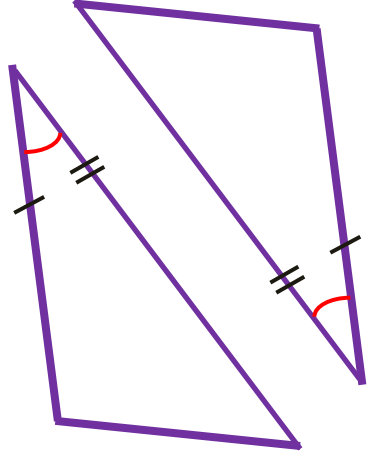
A transformation such that for any point  $V$ , its image is the point  $V'$ , where  $RV = RV'$  and  $m\angle VRV' = x^\circ$ . The image  $R$  itself. The positive number of degrees  $x$  that a figure rotates is the *angle of rotation*.

## rotation

# SAS



# SAS



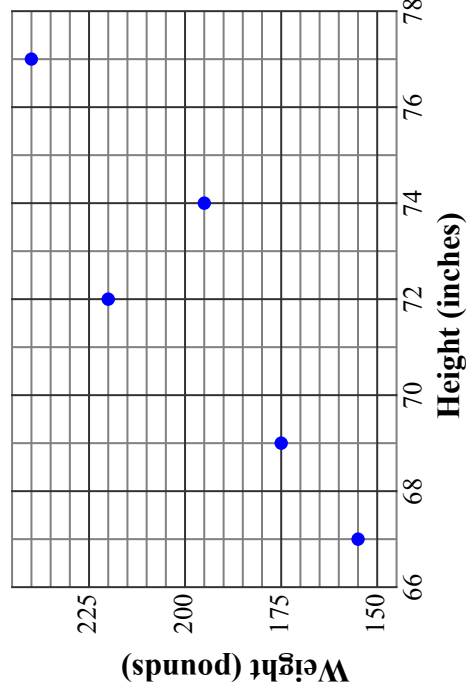
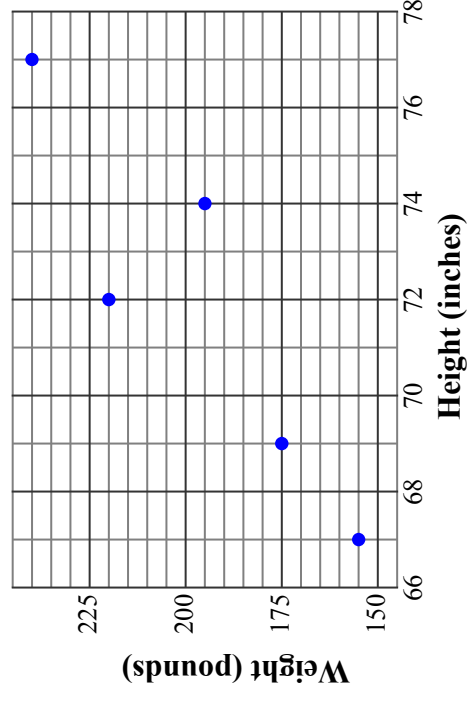
## SAS (Side-Angle-Side)

If two sides and the included angle of a triangle are congruent to two sides and the included angle of another triangle, then the two triangles are congruent.

# SAS

# scatter plot

## scatter plot



## scatter plot

A graphic tool used to display the relationship between two quantitative (numerical) variables.



# segment

## segment



Part of a line that is bounded by two end points, and contains every point on the line between its end points.

## segment

# set builder notation

## set builder notation

$$\{x \mid x \in \mathbb{R} \text{ and } x > 0\}$$

This is read as “the set of all values  $x$  such that  $x$  is a real number and  $x$  is greater than 0.

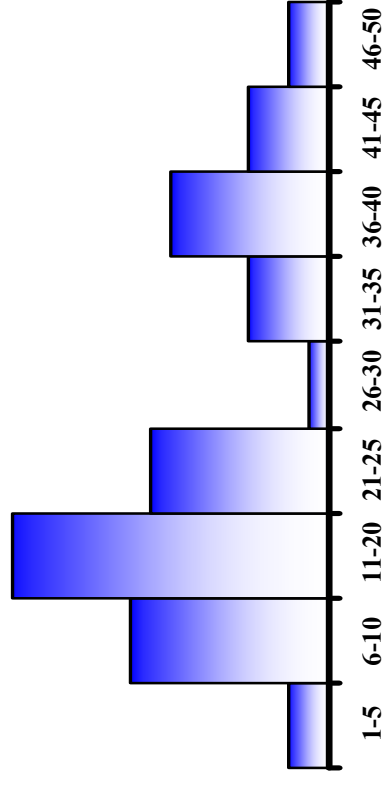
## set builder notation

$$\{x \mid x \in \mathbb{R} \text{ and } x > 0\}$$

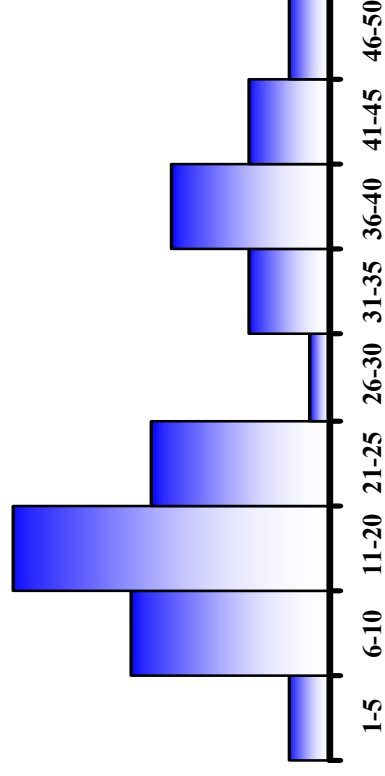
This is read as “the set of all values  $x$  such that  $x$  is a real number and  $x$  is greater than 0.

A notation used to describe the elements of a set.

# shape



# shape



The shape of a distribution is described by symmetry, number of peaks, direction of skew, or uniformity.

# shape

# simultaneous equations

simultaneous  
equations

$$2x - 5y = 1$$

$$3x + 5y = 14$$

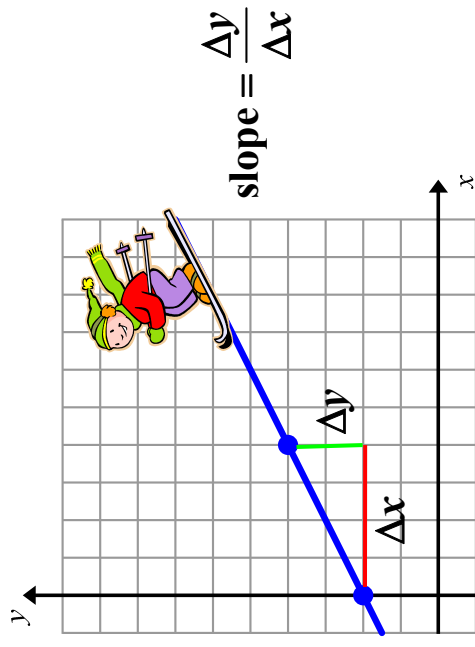
simultaneous  
equations

$$2x - 5y = 1$$

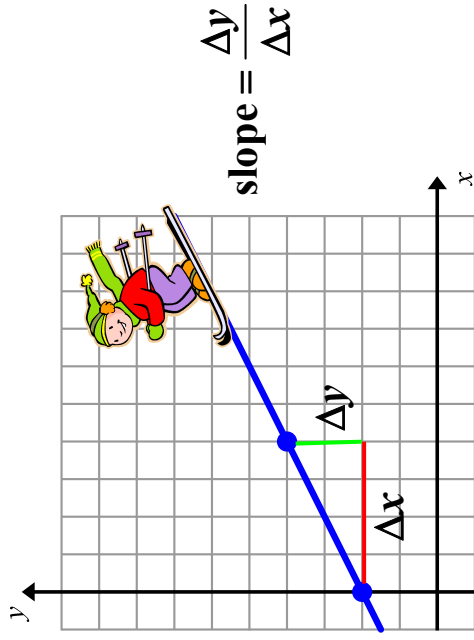
$$3x + 5y = 14$$

A set of equations in two or more variables for which there are values that can satisfy all the equations simultaneously.

# slope



# slope

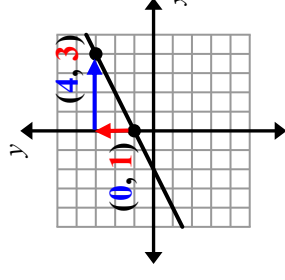


Slope describes steepness, incline, or grade of a line.  
A higher slope value indicates a steeper incline.  
The slope of a line is the ratio of the change in  $y$  over the change in  $x$ .

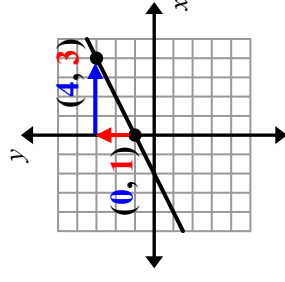
# slope

# slope formula

## slope formula



$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 1}{4 - 0} = \frac{2}{4} = \frac{1}{2}$$



$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 1}{4 - 0} = \frac{2}{4} = \frac{1}{2}$$

## slope formula

The formula used to find the slope of a line. Slope is often represented with the variable  $m$ .

$$\text{slope} = \frac{\text{rise } \Delta y}{\text{run } \Delta x}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}, \text{ where } x_2 - x_1 \neq 0$$

# SOLUTION

## Examples:

- The only solution for the equation  $2x - 15 = -3$  is  $x = 4$ .
- The solutions which satisfy the inequality  $2x + 3 \leq 7$  are all values which are less than or equal to  $x$ , denoted  $x \leq 2$ , or  $(-\infty, 2]$ .



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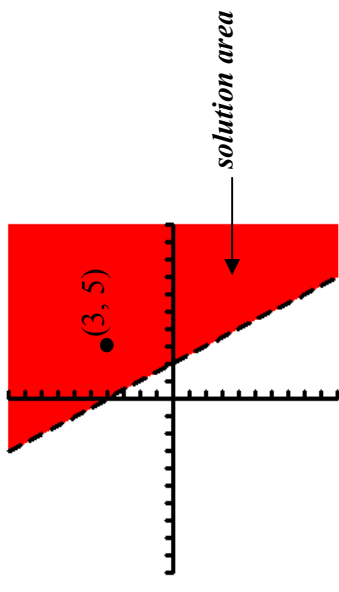
Any and all value(s) of the variable(s) which; satisfies an equation, or inequality.

# SOLUTION

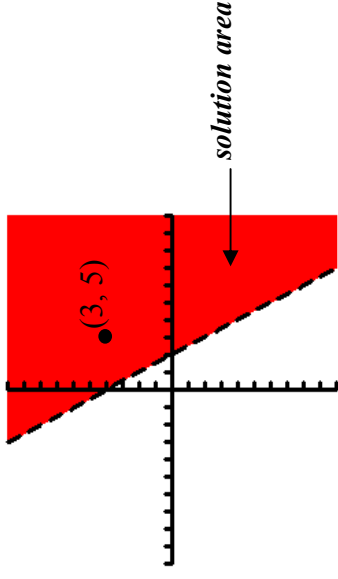
# solution area

## solution area

Example:  $(3, 5)$  is a solution.



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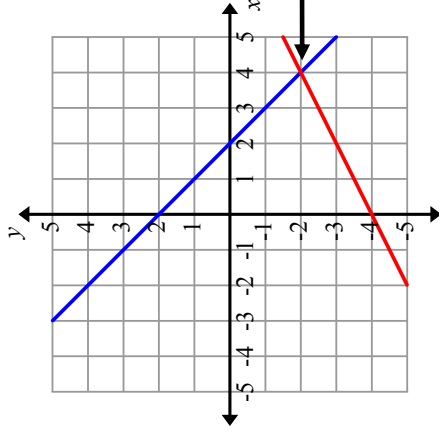
A value or ordered pair is in the *solution area* of an inequality if the value or values from the ordered pair make the inequality true when substituted into the inequality.

## solution area



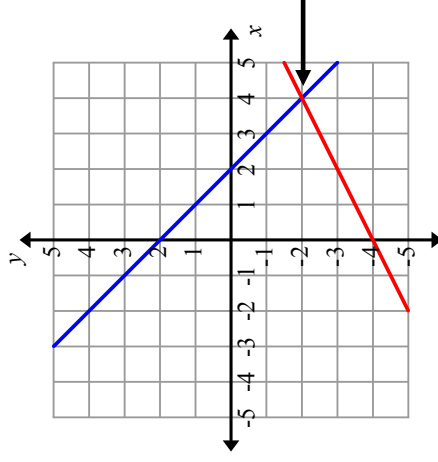
# solution point

# solution point



The solution point is the ordered pair where the two lines intersect  $(4, -2)$ .

# solution point

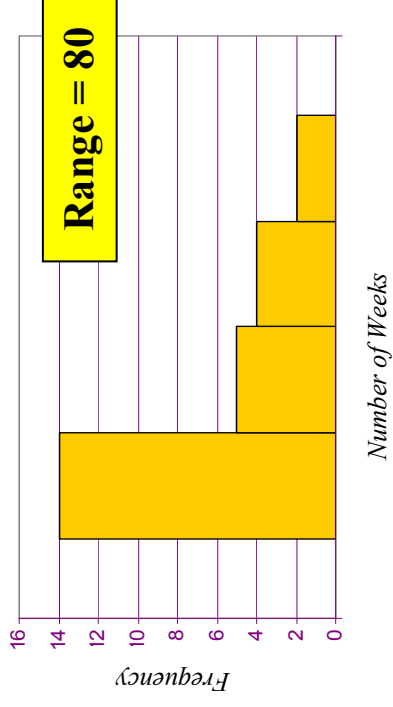


The solution point is the ordered pair where the two lines intersect  $(4, -2)$ .

A solution point or intersection; is a single point where two lines meet or cross each other.

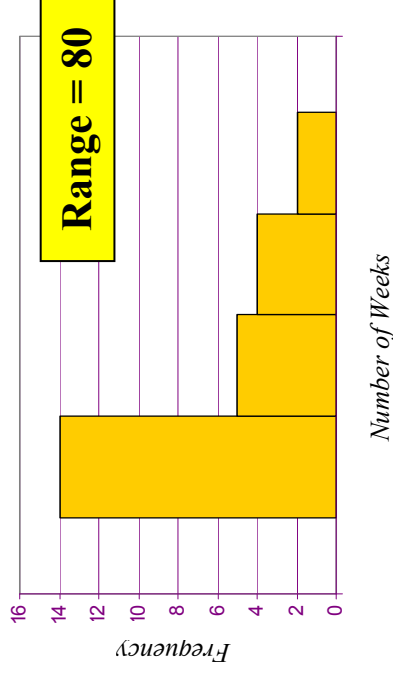
# spread

*Number of Weeks on the Top 200 Chart*



# spread

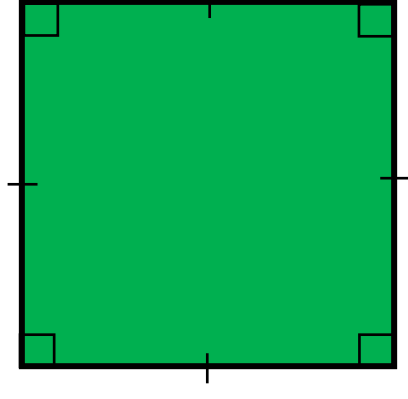
*Number of Weeks on the Top 200 Chart*



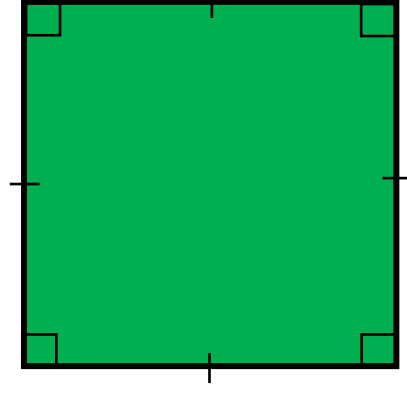
A measure of how much a collection of data is spread out. Commonly used types include range, quartiles, and standard deviation. (Also known as measures of variation or dispersion.)

# spread

# square



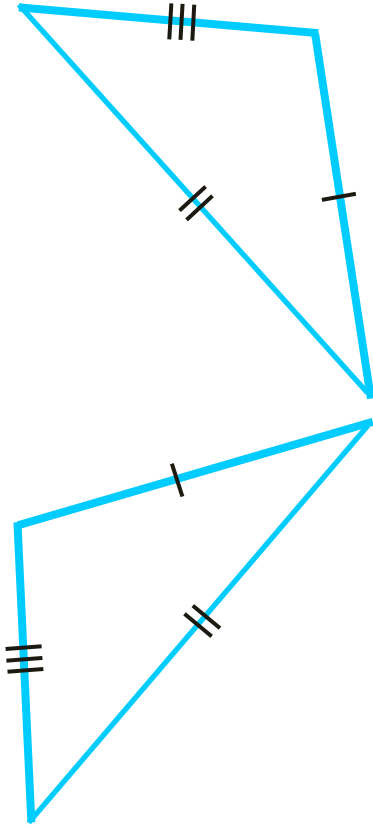
# square



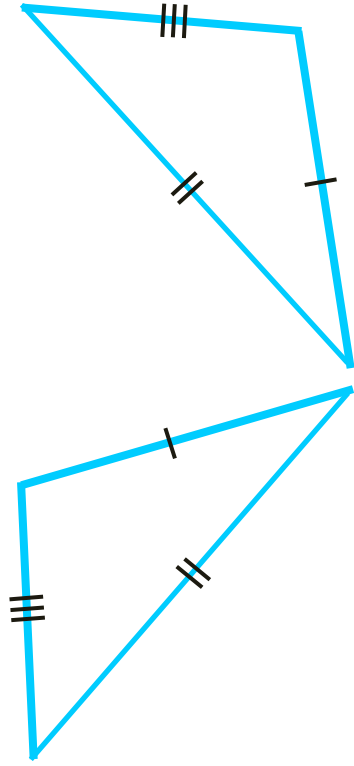
A parallelogram with four  
equal angles AND four  
equal sides.

# square

# SSS



# SSS



**SSS (Side-Side-Side)**

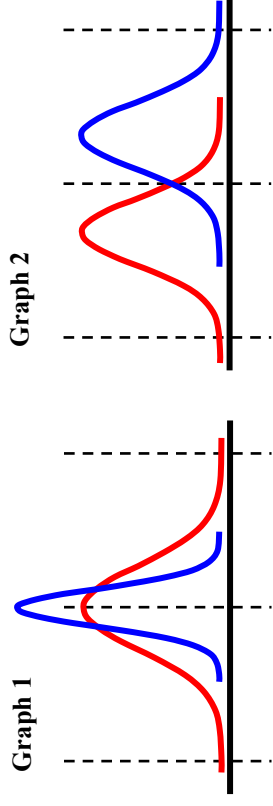
If the three sides of one triangle are congruent to the three sides of another triangle, then the two triangles are congruent.

# SSS

# standard deviation

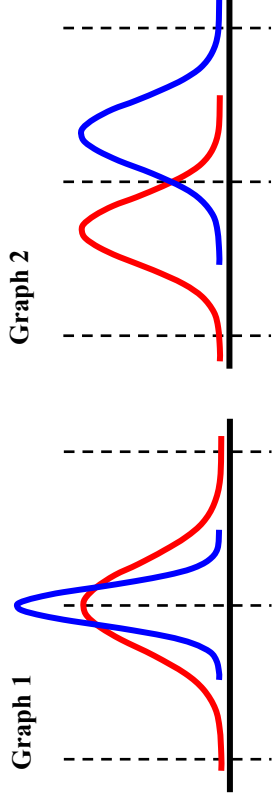
**Example:** In *Graph 1* two sets of data are being compared. They have the same mean, but the standard deviations are different. The red distribution has a greater spread than the blue distribution. In *Graph 2* the two distributions have about the same spread/standard deviation, but different means.

# standard deviation



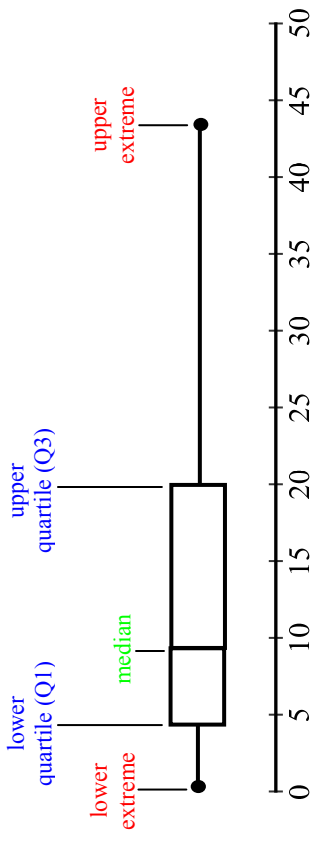
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# standard deviation

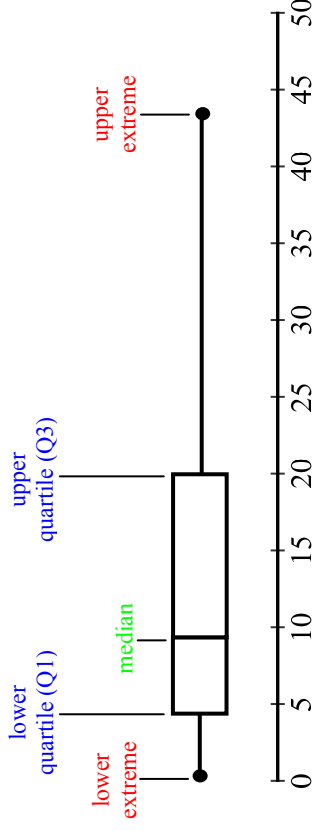


A numerical value used to indicate how widely the individual data in a group vary.

# statistical variability



# statistical variability



A variability or spread in a variable or a probability distribution. Common examples of measures of statistical dispersion are the variance, standard deviation, and interquartile range.

# statistical variability

# substitution

$$y = 3x + 2 \text{ and } 4x + 2y = -6$$

① Substitute for  $y$  and solve for  $x$ .

$$4x + 2(3x + 2) = -6$$

$$4x + 6x + 4 = -6$$

$$10x + 4 = -6$$

$$\begin{array}{r} -4 \quad -4 \\ \hline \end{array}$$

$$\frac{10x}{10} = \frac{-10}{10}$$

$$x = -1$$

② Substitute for  $x$  and solve for  $y$ .

$$y = 3(-1) + 2$$

$$y = -3 + 2$$

$$y = -1$$

**Solution:** **(-1, -1)**

# substitution

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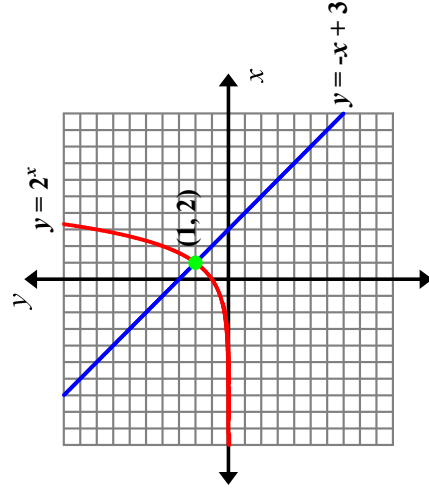
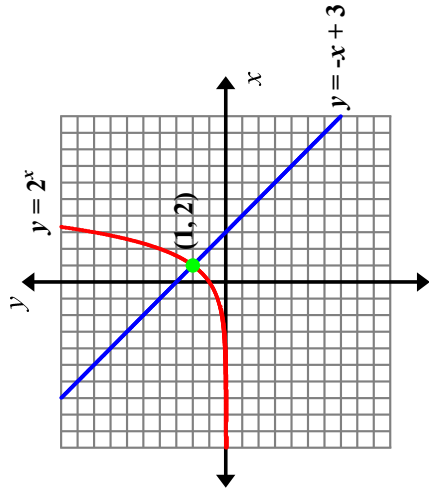
**Solution:** **(-1, -1)**

A method for solving a system of linear equations. It is used to eliminate one of the variables by isolating one variable in one equation, and substituting the resulting expression for that variable in the other equation.

# substitution

# system of equations

## system of equations



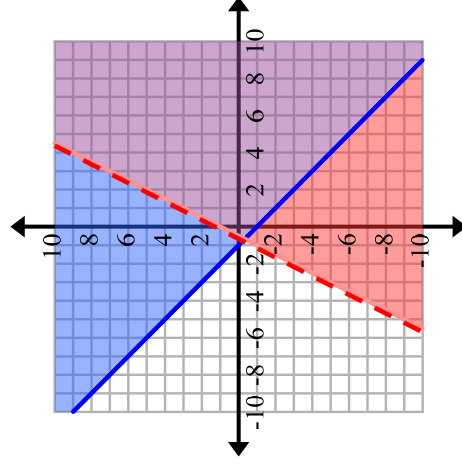
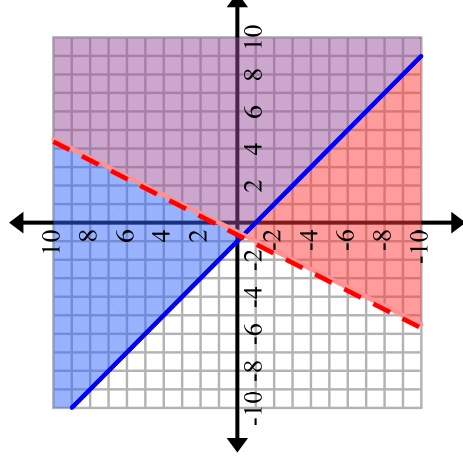
## system of equations

A system of equations is two or more equations with the same variables, graphed on same coordinate plane.



# system of linear inequalities

## system of linear inequalities



## system of linear inequalities

A system of inequalities is two or more inequalities with the same variables, graphed on the same coordinate plane. The set of solutions of a system of linear inequalities corresponds to the intersection of the half-planes defined by individual inequalities.

# table of values

## table of values

$x$	$f(x)$
0	1
1	4
2	7
3	10
4	13
5	16
6	19

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0	1
1	4
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## table of values

A list of numbers that are used to substitute one variable, such as within an equation of a line or other functions, to find the value of the other variable.

# term

# term

$$3x - 5 = -7x + 10$$

term

# term

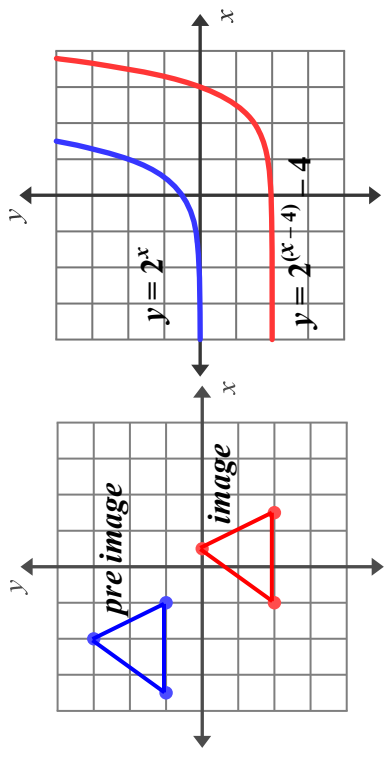
$$3x - 5 = -7x + 10$$

term

A mathematical expression which may form a separable part of an equation, a series, or another expression.

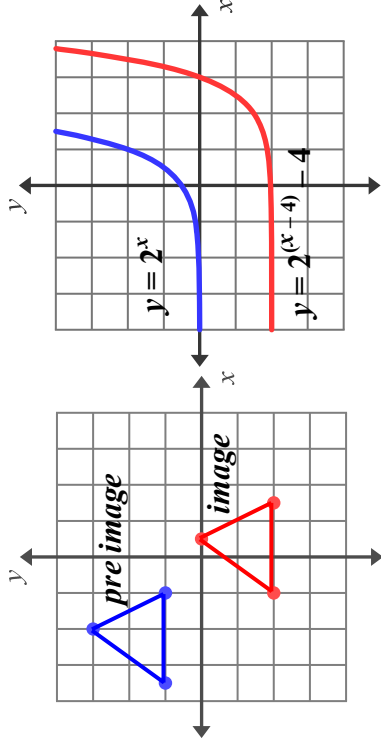
# transformation

## transformation



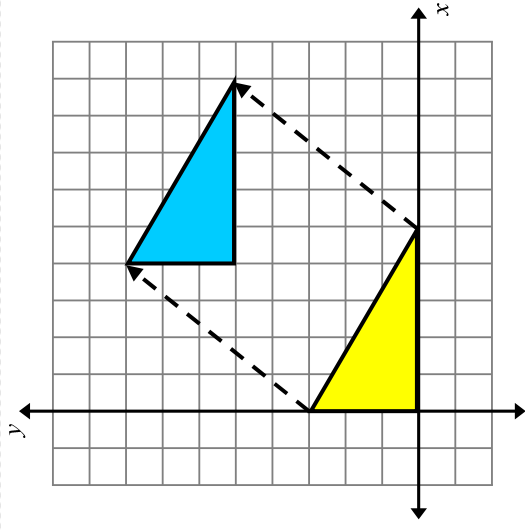
To change the position of a shape or function on a coordinate plane. There are three basic transformations:

- translations
- reflections
- rotations

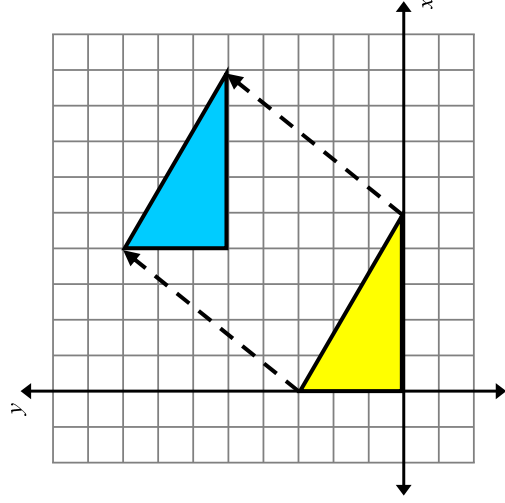


## transformation

# translation



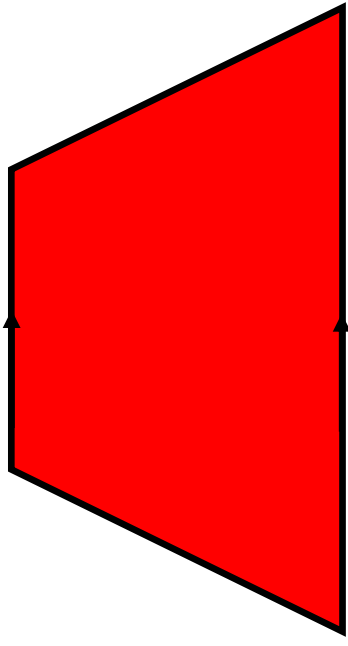
# translation



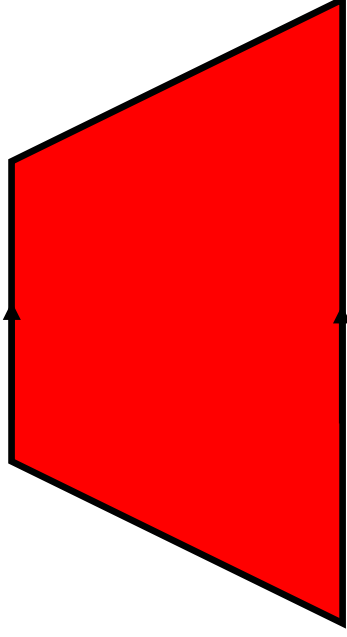
A transformation that moves points the same distance in the same direction.

# translation

# trapezoid



# trapezoid



# trapezoid

A quadrilateral with only  
one pair of parallel sides.

# trend

## Males vs. Females in the US Military

Although there are still more males than females in the Armed Forces, the *trend* is that the gap is closing. However, there is no association between the number of females and the number of males in the US Military. That is, we cannot draw any conclusions about a relationship between the two.

# trend

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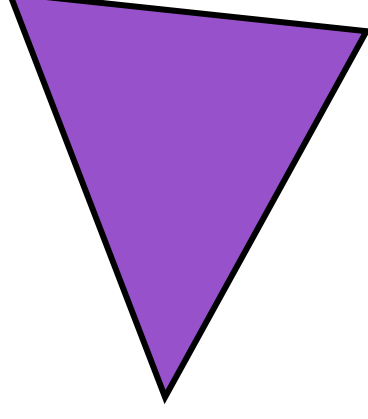
# trend

A change (positive, negative or constant) in data values over time.

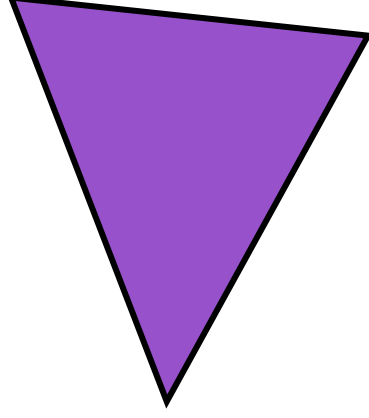
# triangle

---

# triangle



# triangle



A polygon with three sides  
and three angles.



# two-way frequency table

## two-way frequency table

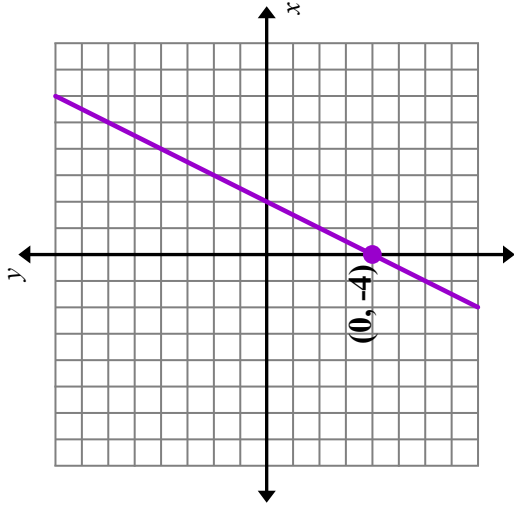
	Dance	Sports	Movies	TOTAL
Women	16	6	8	30
Men	2	10	8	20
TOTAL	18	16	16	50

## two-way frequency table

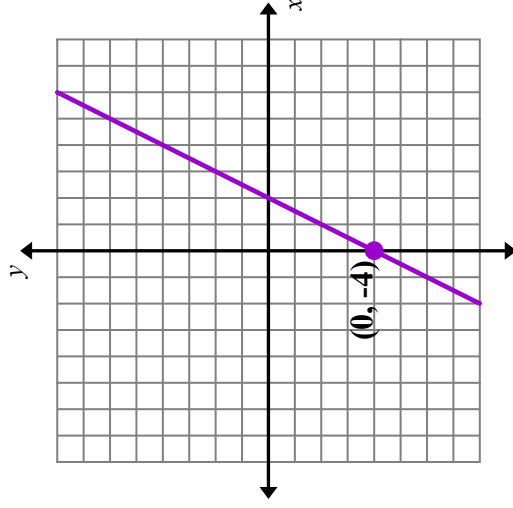
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TOTAL	18	16	16	50

A tool used for  
examining  
relationships  
between categorical  
variables.

# vertical intercept



# vertical intercept



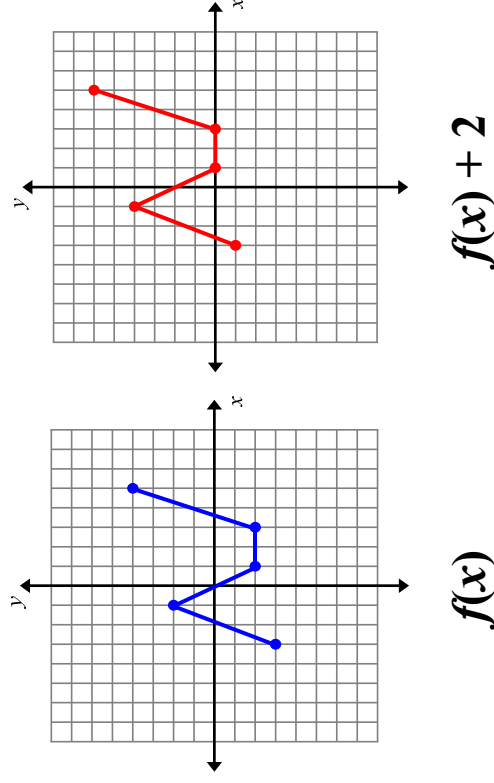
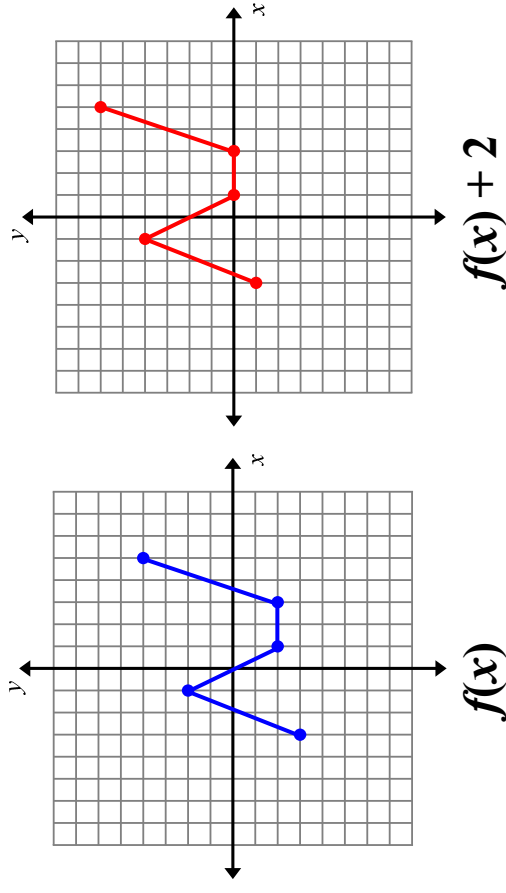
Also known as the  $y$ -intercept. It can be found by substituting “0” for the variable  $x$  in the equation  $y = mx + b$ .

$$y = m \cdot 0 + b$$

# vertical intercept

# vertical translation

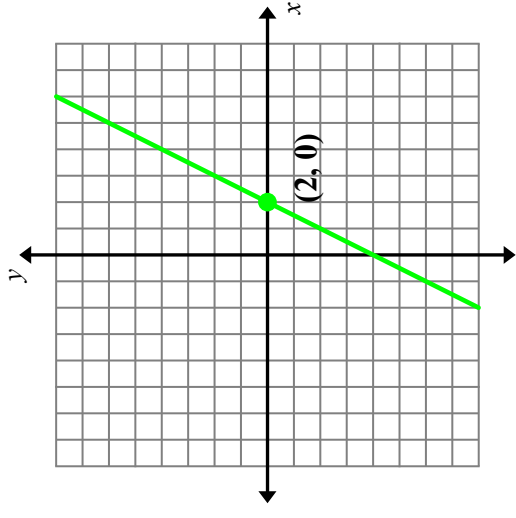
## vertical translation



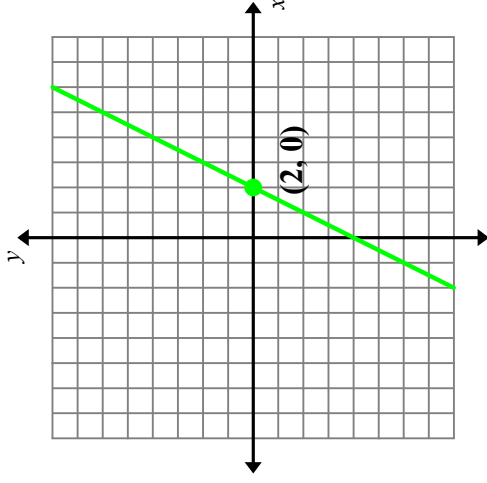
Vertically translating a graph is equivalent to shifting the parent function up or down in the direction of the  $y$ -axis. A graph is translated  $k$  units vertically by moving each point on the graph  $k$  units vertically.

## vertical translation

# ***x*-intercept**



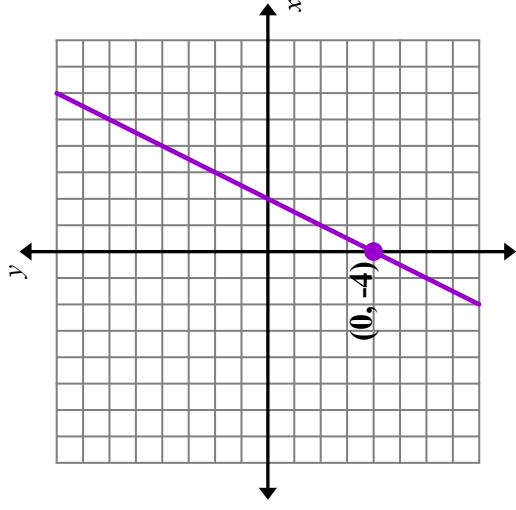
# ***x*-intercept**



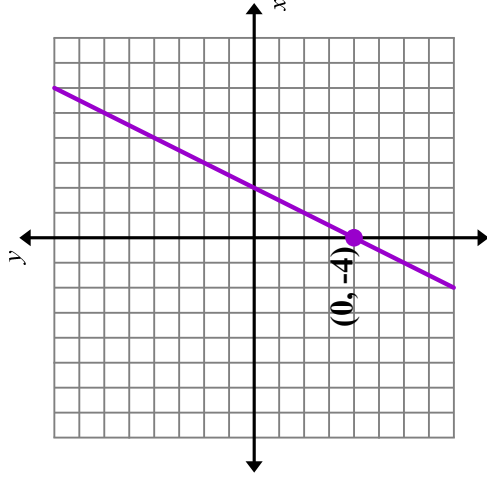
# ***x*-intercept**

The point at which a function crosses the  $x$ -axis.

# ***y-intercept***



# ***y-intercept***



The point at which a function crosses the *y*-axis.

# ***y-intercept***

