

# Middle School Mathematics Vocabulary Word Wall Cards

## Table of Contents (Grades 6-8)

### Number and Number Sense

[Ratio](#)

[Absolute Value](#)

[Fraction Multiplication](#)

[Fraction Division](#)

[Fraction Division](#)

[Percent](#)

[Equivalent Relationships](#)

[Exponential Form](#)

[Perfect Squares](#)

[Powers of Ten](#)

[Scientific Notation](#)

[Natural Numbers](#)

[Whole Numbers](#)

[Integers](#)

[Rational Numbers](#)

[Irrational Numbers](#)

[Real Numbers](#)

[Comparing Integers](#)

### Computation and Estimation

[Order of Operations](#)

[Integer Operations](#)

[Integer Operations](#)

[Integer Operations](#)

[Proportion](#)

[Scale Factor](#)

[Unit Rate](#)

[Percent of Increase](#)

[Percent of Decrease](#)

[Square Root](#)

[Square Root](#)

### Measurement

[Ballpark Comparisons – Length](#)

[Ballpark Comparisons – Weight/Mass](#)

[Ballpark Comparisons – Volume](#)

[Ballpark Comparisons – Temperature](#)

[Perimeter](#)

[Area](#)

[Pi](#)

[Circumference](#)

[Area of a Circle](#)

[Volume of a Prism](#)

[Surface Area](#)

[Vertex](#)

[Face and Base](#)

[Pyramid](#)

[Prism](#)

[Cone](#)

[Cylinder](#)

[Volume – Changing One Attribute](#)

[Complementary Angles](#)

[Supplementary Angles](#)

[Vertical Angles](#)

[Adjacent Angles](#)

[Similar Figures](#)

[Similar Figures and Proportions](#)

## **Geometry**

[Congruent Figures](#)

[Triangles](#)

[Quadrilaterals](#)

[Quadrilateral Relationships](#)

[Parallelogram](#)

[Rhombus](#)

[Rectangle](#)

[Square](#)

[Trapezoid](#)

[Kite](#)

[Composite Figures](#)

[Right Triangle](#)

[Pythagorean Theorem](#)

[Three Dimensional Models](#)

[Coordinate Plane](#)

[Rotation](#)

[Reflection](#)

[Translation](#)

[Dilation](#)

## **Probability and Statistics**

[Probability](#)

[Probability of Independent Events](#)

[Probability of Dependent Events](#)

[Fundamental Counting Principle](#)

[Tree Diagram](#)

[Mean](#)

[Median](#)

[Mode](#)

[Range](#)

[Bar Graph](#)

[Line Graph](#)

[Stem-and-Leaf Plot](#)

[Circle Graph](#)

[Histogram](#)

[Scatterplot](#)

[Positive Correlation](#)

[Negative Correlation](#)

[Constant Correlation](#)

[No Correlation](#)

## **Patterns, Functions and Algebra**

[Arithmetic Sequence](#)

[Geometric Sequence](#)

[Additive Identity Property](#)

[Additive Inverse Property](#)

[Associative Property](#)

[Commutative Property](#)

[Multiplicative Identity Property](#)

[Multiplicative Inverse Property](#)

[Multiplicative Property of Zero](#)

[Distributive Property](#)

[Equation](#)

[Expression](#)

[Variable](#)

[Coefficient](#)

[Term](#)

[Constant](#)

[Inequality](#)

[Like Terms](#)

[Relations](#)

[Functions](#)

[Table of Values](#)

[Domain](#)

[Range](#)

[Dependent/independent Variable](#)

[Independent Variable](#)

[Dependent Variable](#)

[Connecting Representations](#)

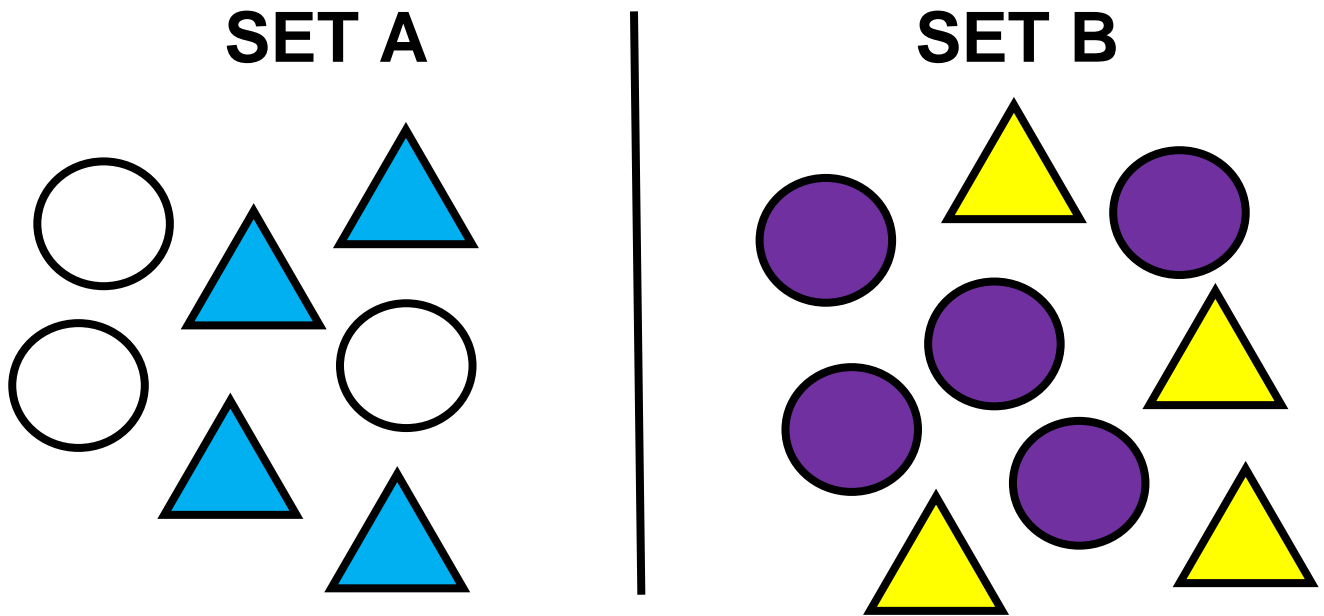
[Multistep Equations](#)






[Multistep Equations](#)

[Unit Rate as Slope](#)

# Ratio

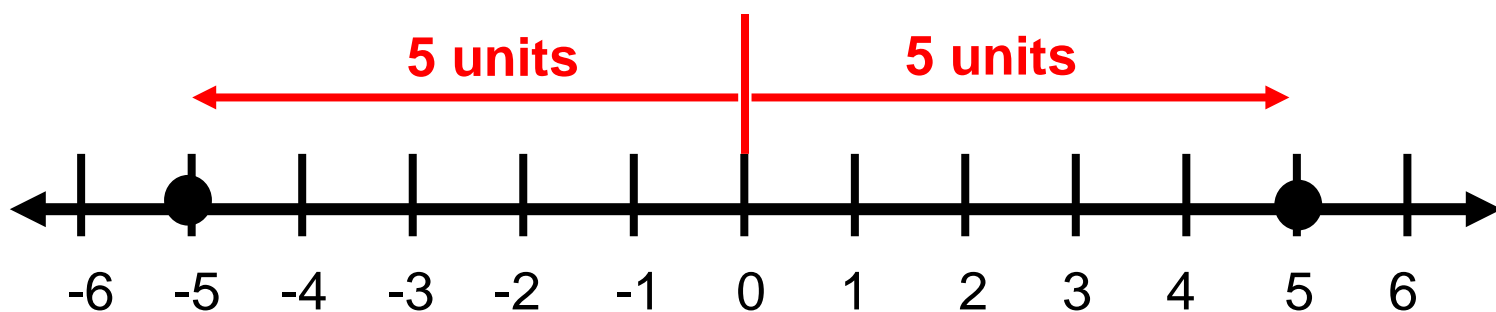
a comparison of any two quantities



 to 	<b>4 to 3</b>
 to all of set A	$\frac{4}{7}$
 to 	<b>3:5</b>
set B to set A	<b>9 to 7 or 9:7</b>

# Absolute Value

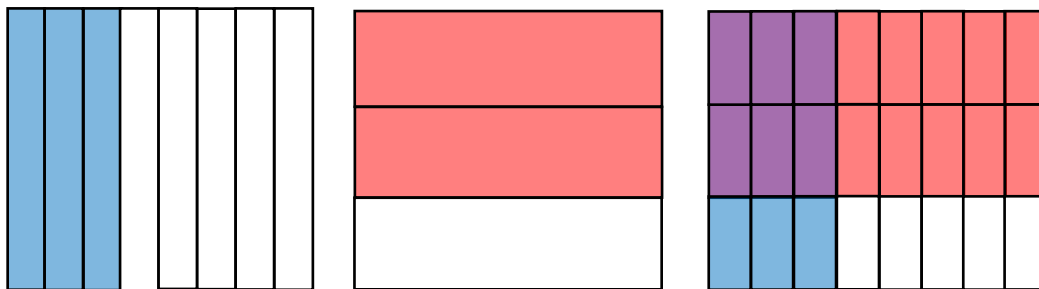
$$|5| = 5 \quad |-5| = 5$$



distance a number is from zero

# Fraction Multiplication

How much is  $\frac{3}{8}$  of  $\frac{2}{3}$  ?



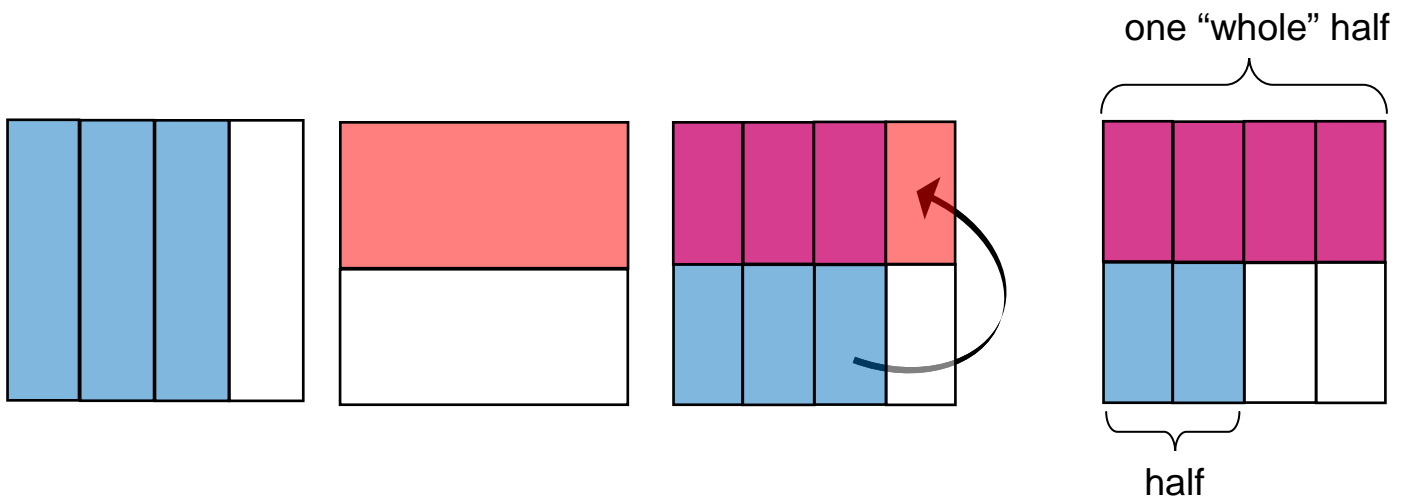
$$\frac{3}{8} \times \frac{2}{3} = \frac{6}{24}$$

$$\frac{3}{8} \times \frac{2}{3} = \frac{6}{24} = \frac{1}{4}$$

# Fraction Division

$$\frac{3}{4} \div \frac{1}{2}$$

How many halves are in three-fourths?



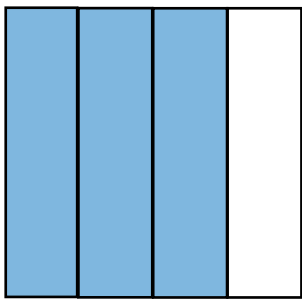
There are  $1\frac{1}{2}$  halves in three-fourths.

$$\frac{3}{4} \div \frac{1}{2} = 1\frac{1}{2}$$

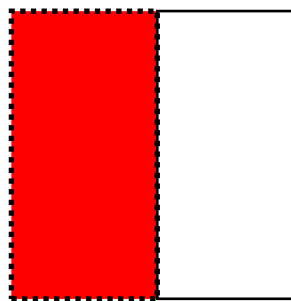
# Fraction Division

$$\frac{3}{4} \div \frac{1}{2}$$

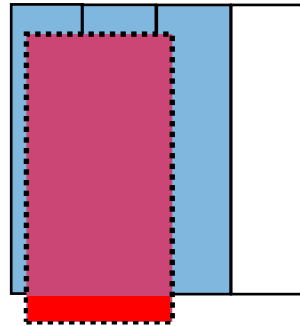
How many halves are in three-fourths?



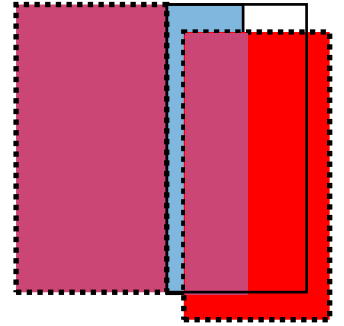
three-fourths



one-half



1 "whole" one-half



$\frac{1}{2}$  one-half

There are  $1\frac{1}{2}$  halves in three-fourths.

$$\frac{3}{4} \div \frac{1}{2} = 1\frac{1}{2}$$

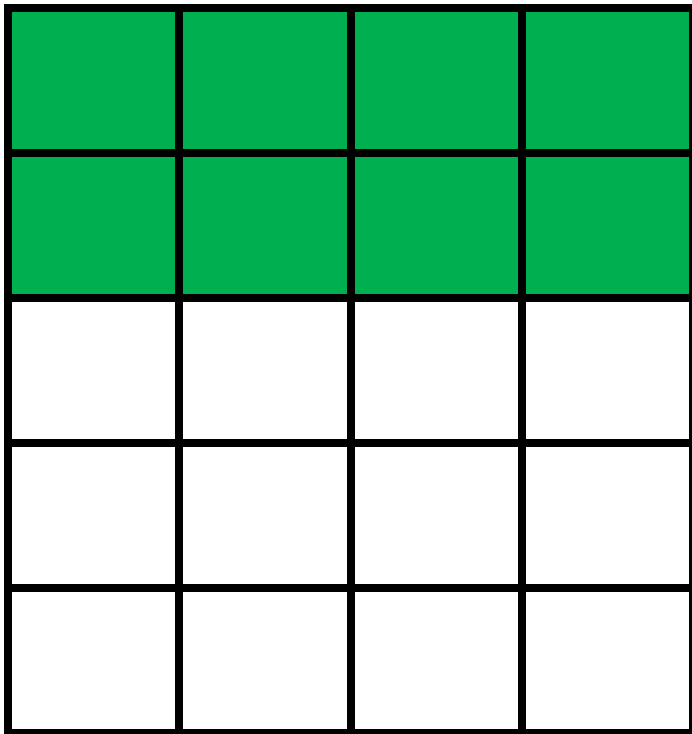
# Percent

Per hundred

$$56\% = \frac{56}{100} = \frac{14}{25} = 0.56$$



# Equivalent Relationships



Fraction:  $\frac{2}{5}$

Decimal: 0.4

Percent: 40%

# Exponential Form

The diagram illustrates exponential form with two examples. The first example is  $2^3 = 2 \cdot 2 \cdot 2$ . The second example is  $n^4 = n \cdot n \cdot n \cdot n$ . Red arrows point from the word "base" to the base of each exponential expression (2 and n) and from the word "exponent" to the exponent of each exponential expression (3 and 4). A bracket under the product of four n's in the second example is labeled "factors".

$$2^3 = 2 \cdot 2 \cdot 2$$
$$n^4 = n \cdot n \cdot n \cdot n$$

factors

# Perfect Squares

$$0^2 = 0 \cdot 0 = \mathbf{0}$$

$$1^2 = 1 \cdot 1 = \mathbf{1}$$

$$2^2 = 2 \cdot 2 = \mathbf{4}$$

$$3^2 = 3 \cdot 3 = \mathbf{9}$$

$$4^2 = 4 \cdot 4 = \mathbf{16}$$

$$5^2 = 5 \cdot 5 = \mathbf{25}$$

$$\sqrt{16} = \sqrt{4 \cdot 4} = 4$$

 perfect square

# Powers of Ten

	<b>Meaning</b>	<b>Value</b>
$10^4$	$10 \cdot 10 \cdot 10 \cdot 10$	10,000
$10^3$	$10 \cdot 10 \cdot 10$	1000
$10^2$	$10 \cdot 10$	100
$10^1$	10	10
$10^0$	1	1
$10^{-1}$	$\frac{1}{10}$	0.1
$10^{-2}$	$\frac{1}{10} \cdot \frac{1}{10}$	$\frac{1}{100} = 0.01$
$10^{-3}$	$\frac{1}{10} \cdot \frac{1}{10} \cdot \frac{1}{10}$	$\frac{1}{1000} = 0.001$
$10^{-4}$	$\frac{1}{10} \cdot \frac{1}{10} \cdot \frac{1}{10} \cdot \frac{1}{10}$	$\frac{1}{10,000} = 0.0001$

# Scientific Notation

$$a \times 10^n$$

$a$  = number greater than or  
equal to 1 and less than 10

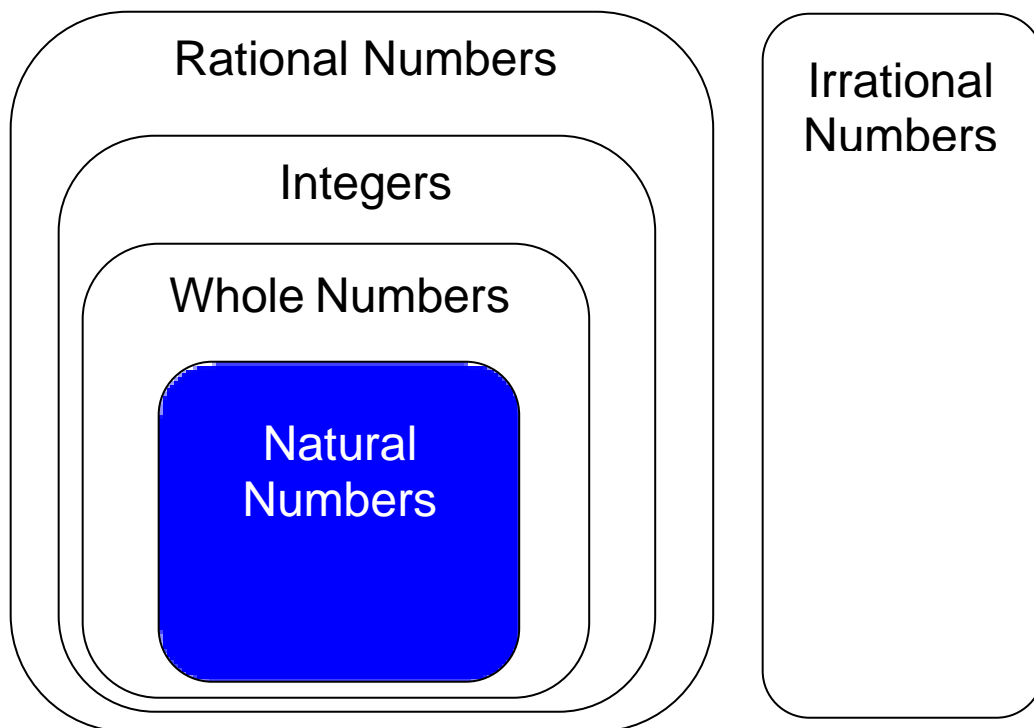
$n$  = integer

$$17,500,000 = 1.75 \times 10^7$$

$$0.0000026 = 2.6 \times 10^{-6}$$

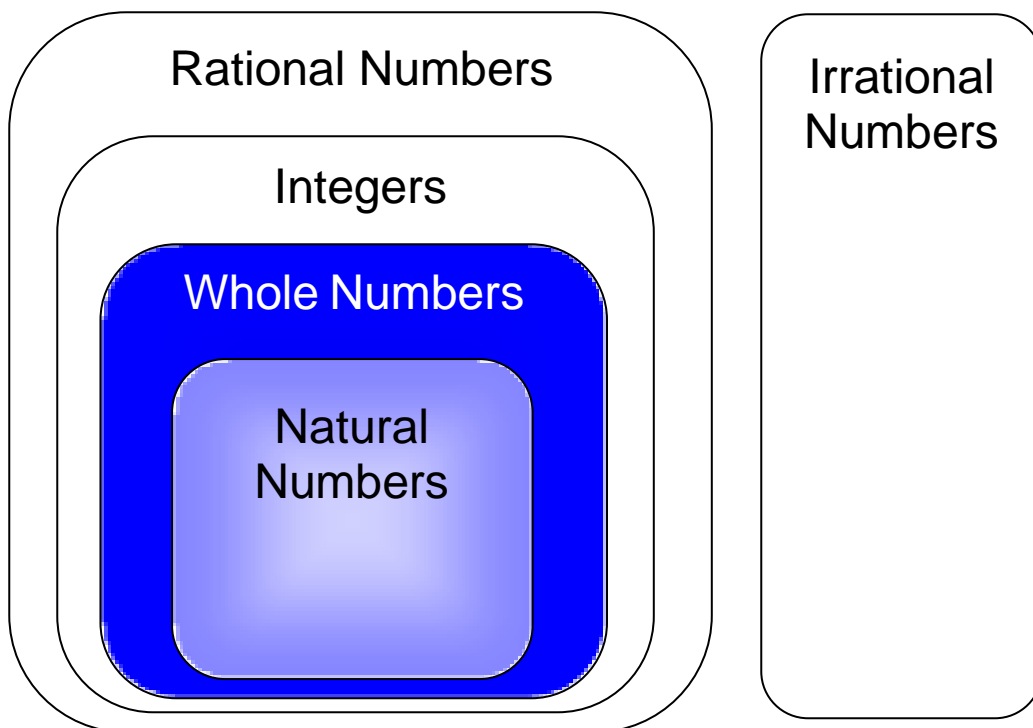
# Natural Numbers

The set of numbers  
1, 2, 3, 4...



# Whole Numbers

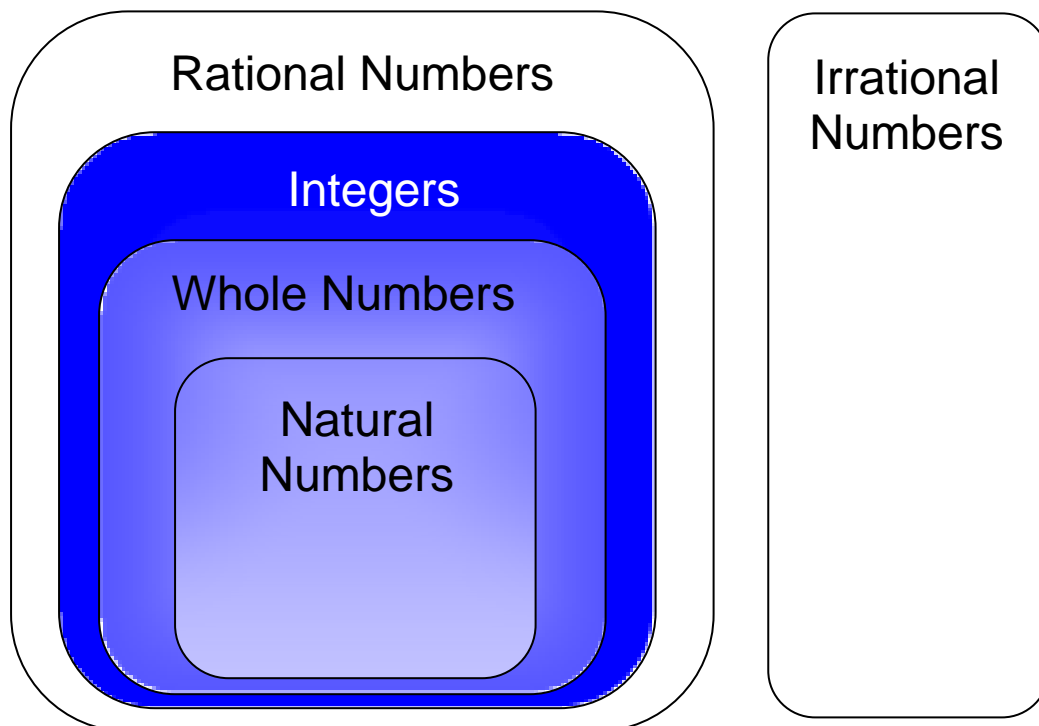
The set of numbers  
0, 1, 2, 3, 4...



# Integers

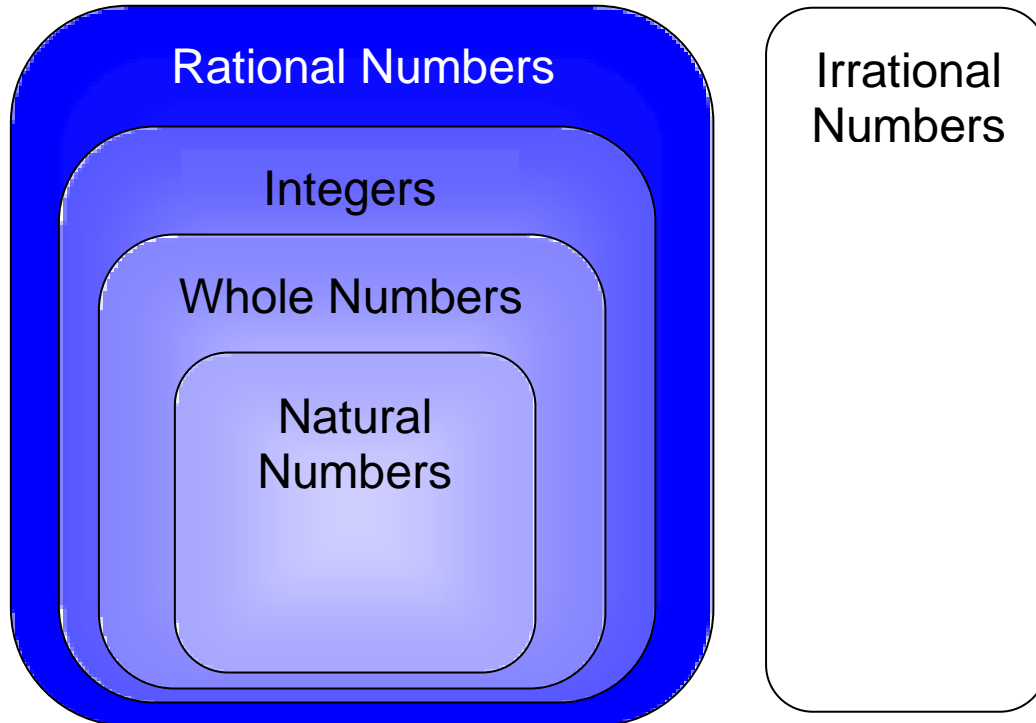
The set of numbers

...-3, -2, -1, 0, 1, 2, 3...





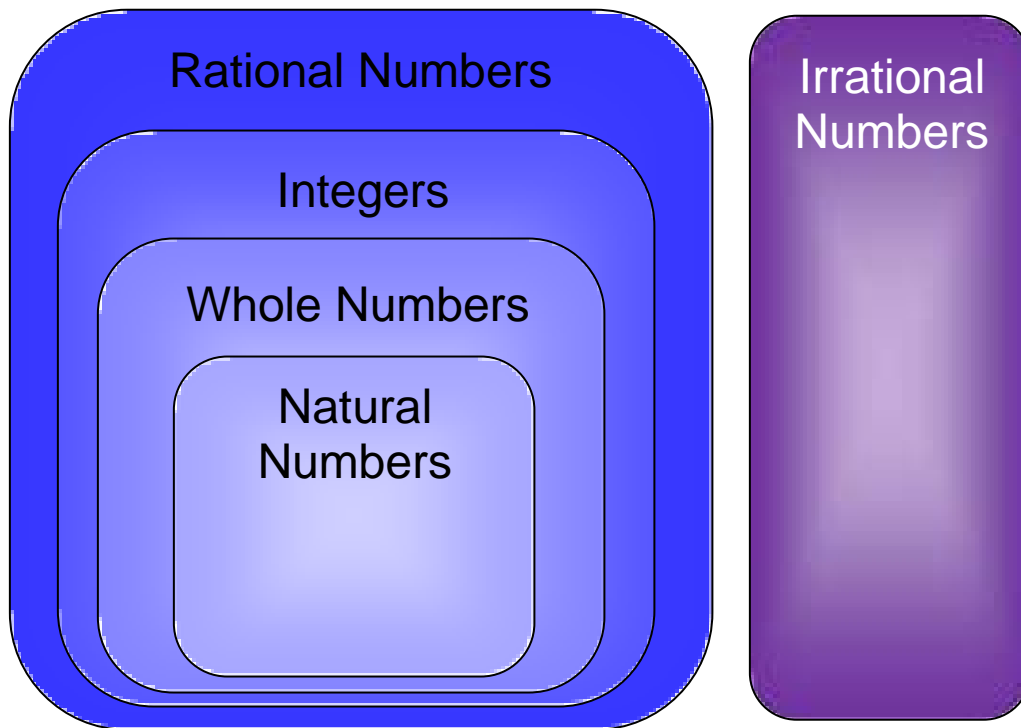
# Rational Numbers



A number that can be written as the quotient of two integers

$$2\frac{3}{5} \quad -5 \quad 0.3 \quad \sqrt{16} \quad \frac{13}{7}$$

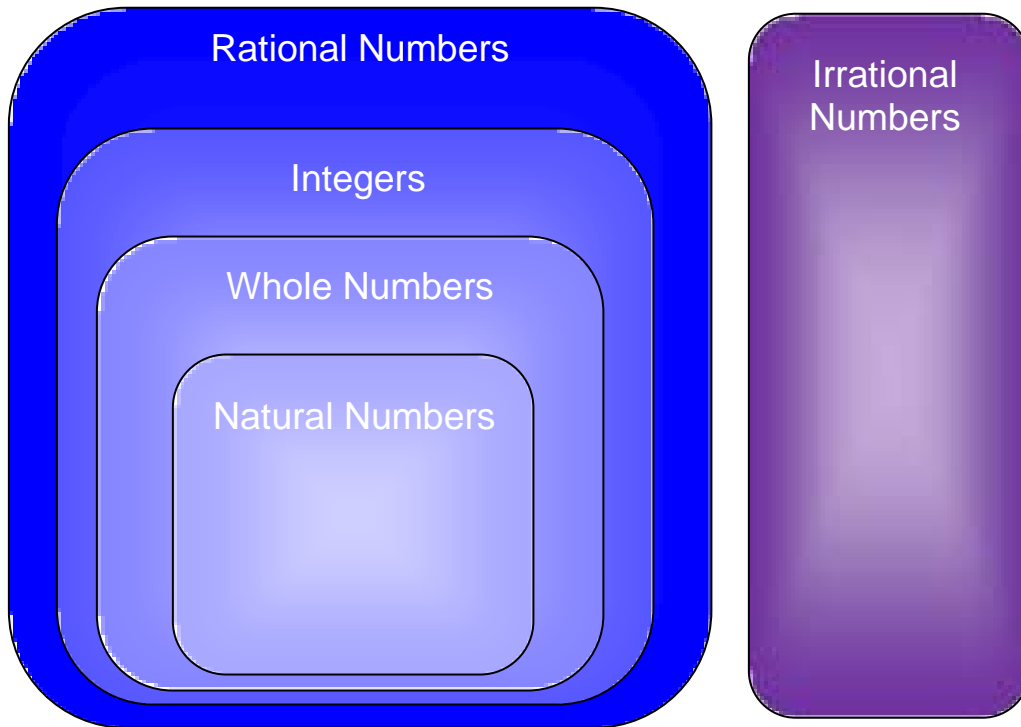
# Irrational Numbers



A number that cannot be expressed as the quotient of two integers

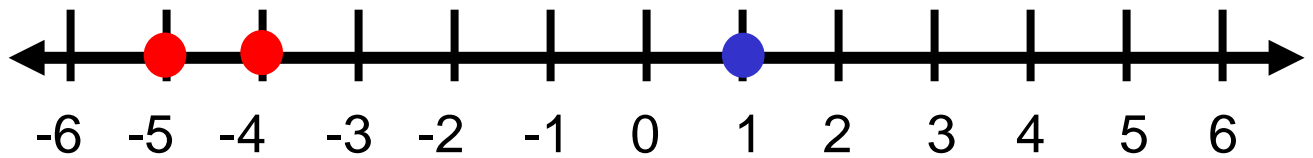
$\sqrt{7}$   $\pi$   $-0.23223222322223\dots$

# Real Numbers



The set of all rational and irrational numbers

# Comparing Integers



$$-5 < 1 \text{ or } 1 > -5$$

$$-4 > -5 \text{ or } -5 < -4$$

# Order of Operations

**G**rouping Symbols

{  
( )  
{ }  
[ ]  
|abs|  
Fraction bar

**E**xponents

**M**ultiplication

**D**ivision

}  
Left  
to  
right

**A**ddition

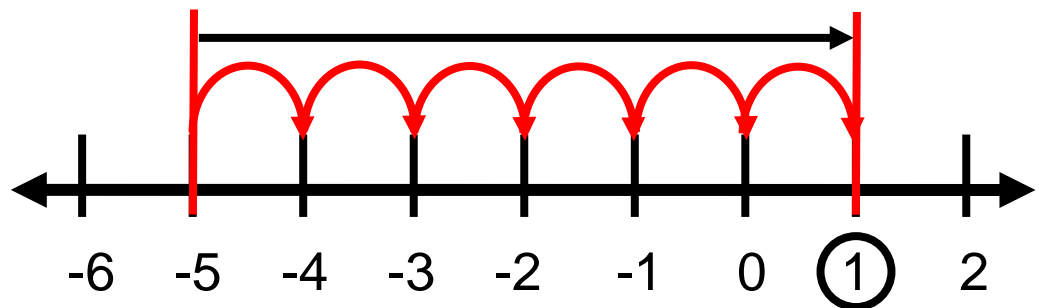
**S**ubtraction

}  
Left  
to  
right

# Integer Operations

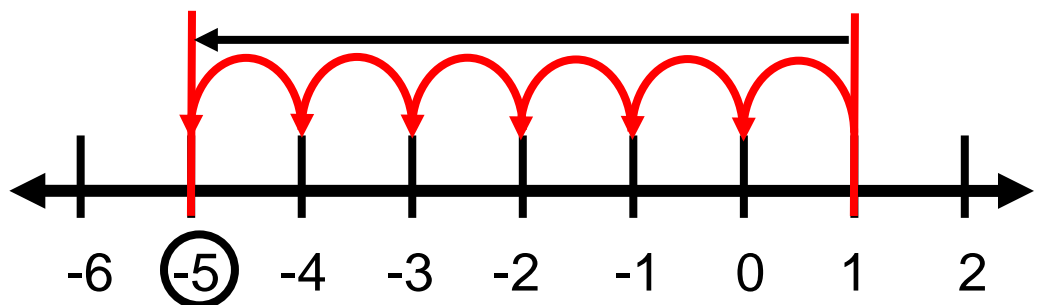
## Addition

$$-5 + 6 = 1$$



## Subtraction

$$1 - 6 = -5$$

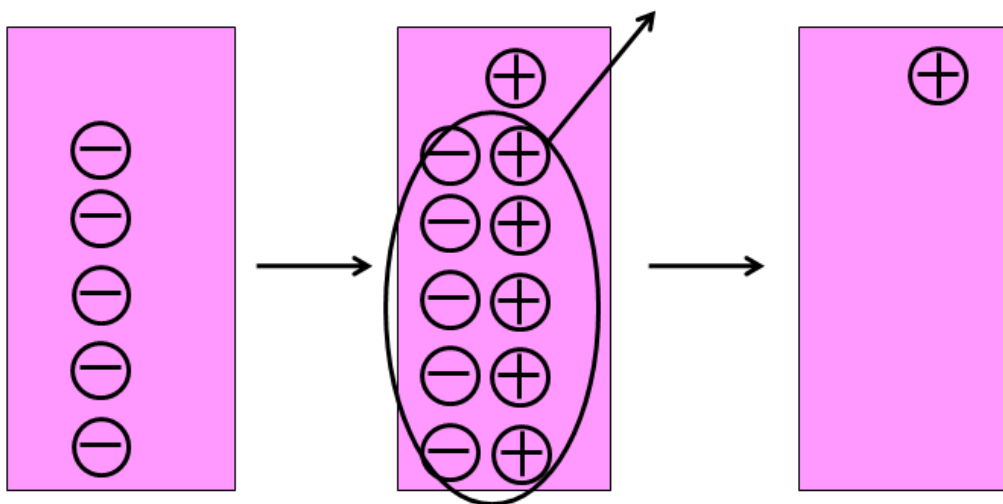


# Integer Operations

## Addition

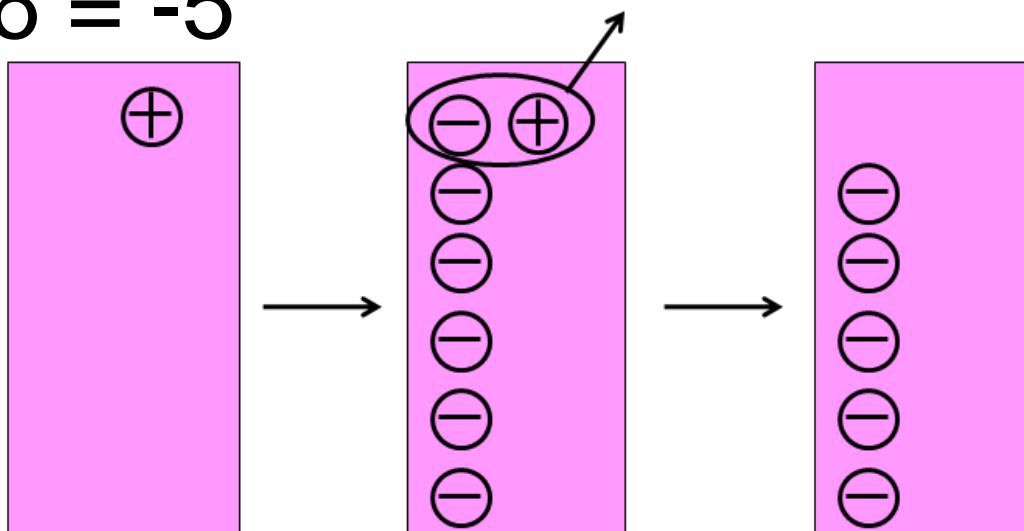
$$-5 + 6 = 1$$

$$\oplus = 1 \quad \ominus = -1$$



## Subtraction

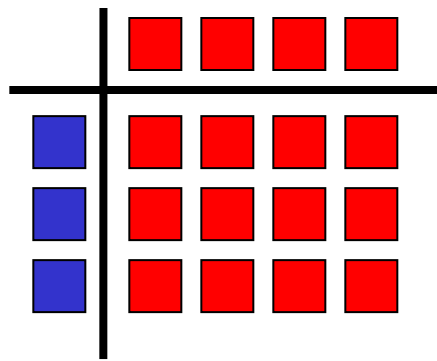
$$1 - 6 = -5$$



# Integer Operations

## Multiplication

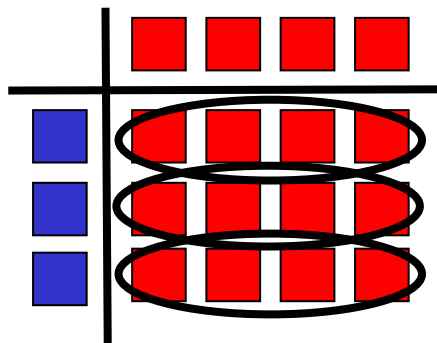
$$3 \cdot (-4) = -12$$



How many tiles are in 3 groups of -4 tiles?

## Division

$$-12 \div -4 = 3$$



How many groups of -4 tiles are in -12 tiles?



# Proportion

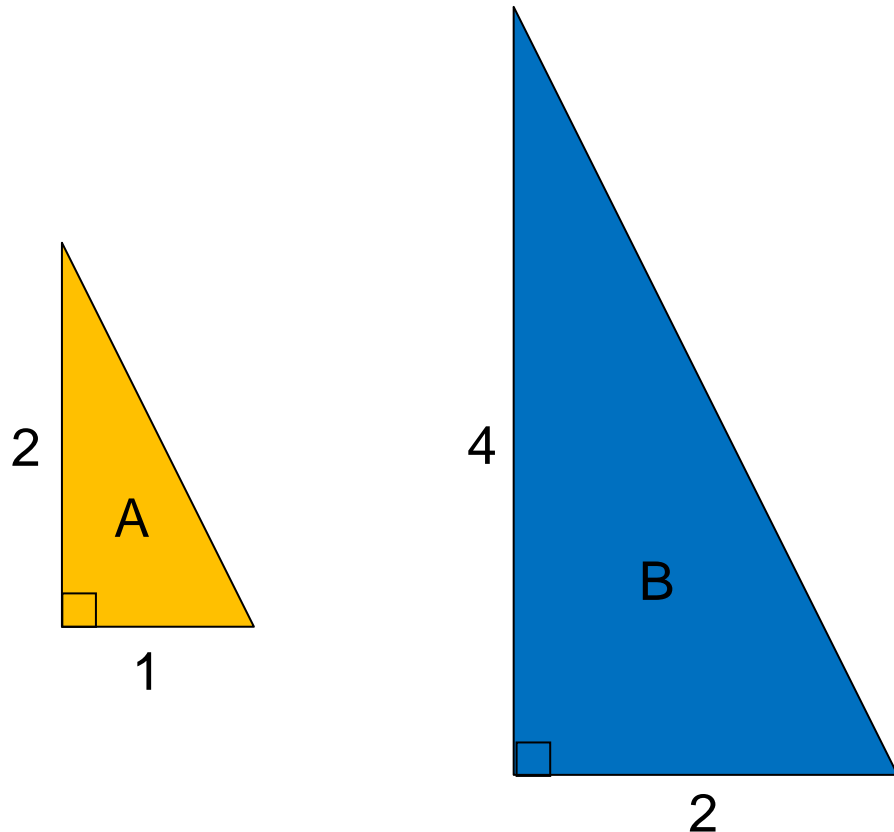
$$\frac{a}{b} = \frac{c}{d}$$

$$a:b = c:d$$

*a is to b as c is to d*

# Scale Factor

Figures A and B are similar.



What is the scale factor from A to B?

Scale factor = 2

What is the scale factor from B to A?

Scale factor =  $\frac{1}{2}$

# Unit Rate

$$\text{\$4 per gallon} = \frac{\text{\$4}}{1 \text{ gallon}}$$

$$70 \text{ miles per hour} = \frac{70 \text{ miles}}{1 \text{ hour}}$$

# Percent of Increase

$$\text{Percent of change} = \frac{\text{new} - \text{original}}{\text{original}}$$



Was \$3.25  
per gallon

Now \$3.85  
per gallon

What is the percent of  
increase?

$$\frac{3.85 - 3.25}{3.25}$$

$$\frac{0.60}{3.25} = 0.18$$

increase of 18%

# Percent of Decrease

$$\text{Percent of change} = \frac{\text{new} - \text{original}}{\text{original}}$$



Was \$1200  
Now only \$900

What is the percent of decrease?


$$\frac{900 - 1200}{1200}$$

$$\frac{-300}{1200} = -0.25$$

decrease of 25%

# Square Root

radical symbol


$$\sqrt{36} = 6$$

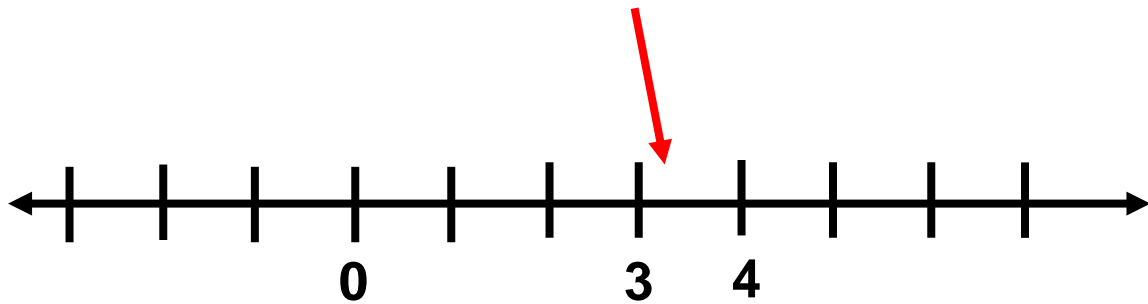
$$\sqrt{36} = \sqrt{6 \cdot 6} = \sqrt{6^2} = 6$$

Squaring a number and taking a square root are inverse operations.

$$-\sqrt{36} = -6$$
$$(-6)^2 = -6 \cdot -6 = 36$$

# Square Root

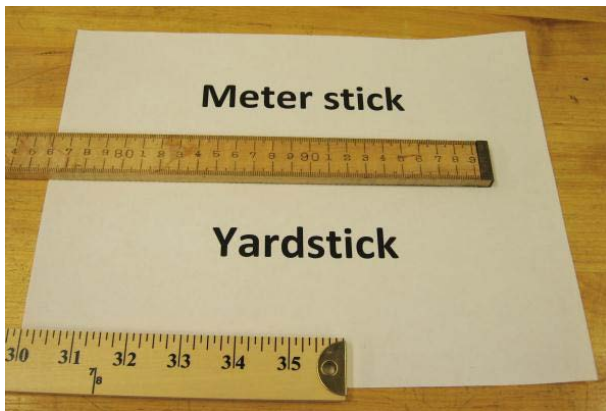
$$\sqrt{10}$$



between  $\sqrt{9}$  and  $\sqrt{16}$

# Ballpark Comparisons Length

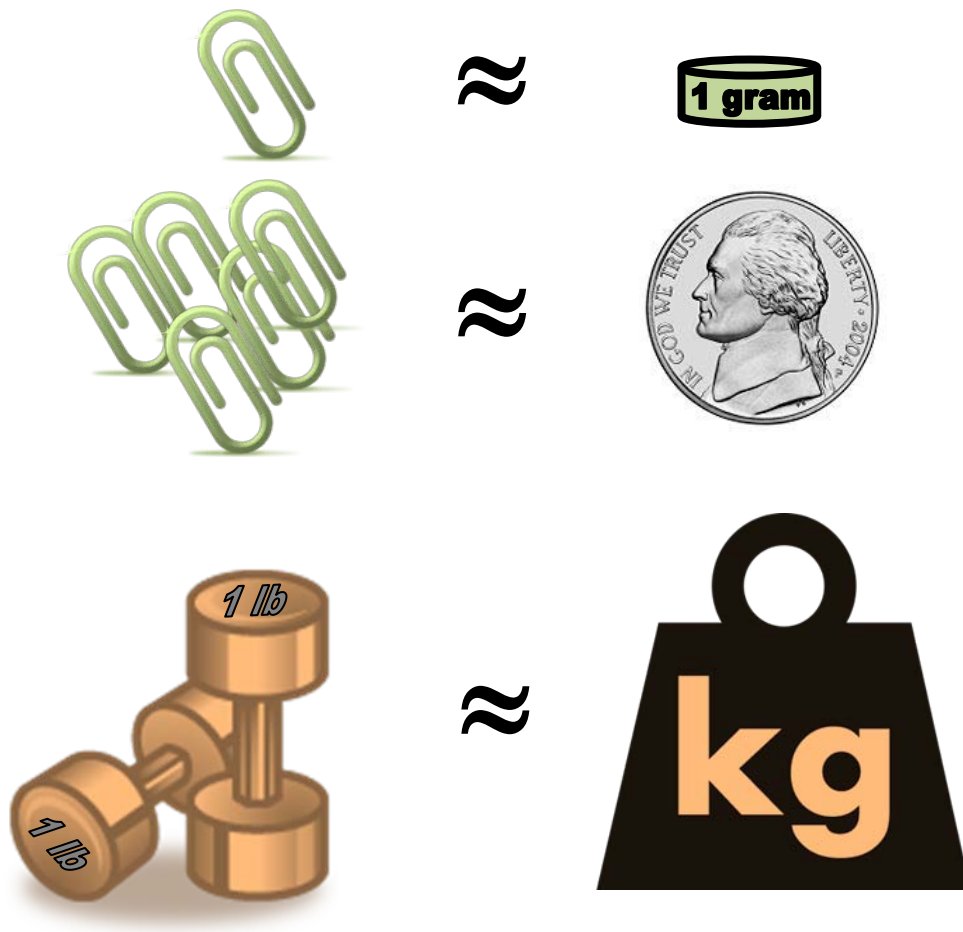
1 inch or  
2.5 centimeter



1 yard < 1 meter



# Ballpark Comparisons Weight/Mass



# Ballpark Comparisons Volume

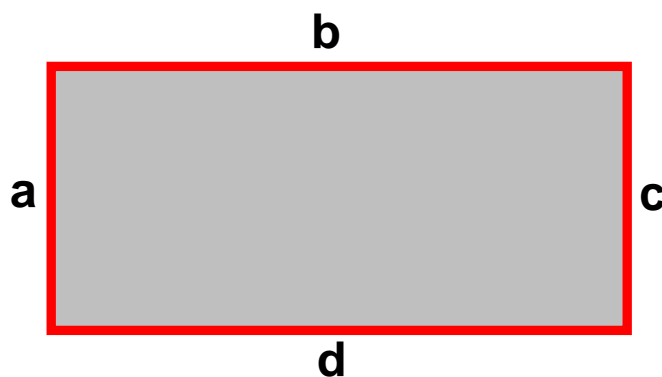


# Ballpark Comparisons Temperature

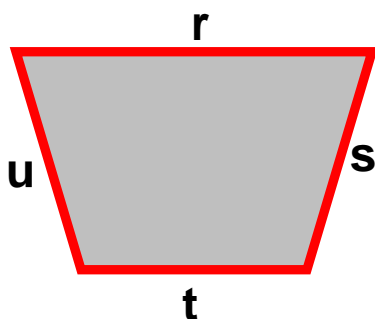
	Fahrenheit	Celsius
Water freezes	32°F	0°C
Water boils	212°F	100°C
Body Temperature	98°F	37°C
Room Temperature	70°F	20°C

# Perimeter

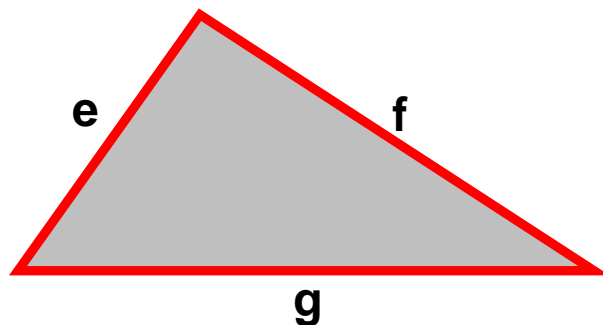
the measure of the distance  
around a figure



$$P = a + b + c + d$$



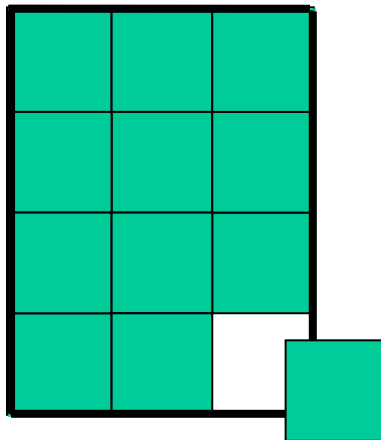
$$P = r + s + t + u$$



$$P = e + f + g$$

# Area

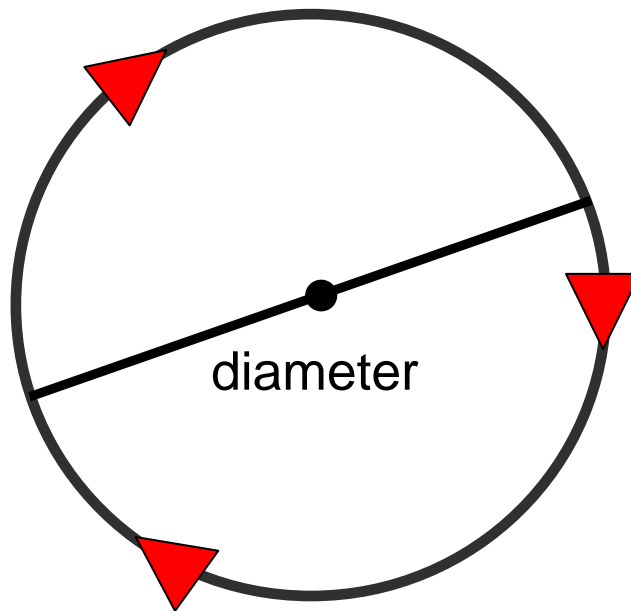
the number of square units needed to cover a surface or figure



Area = 12 Square Units

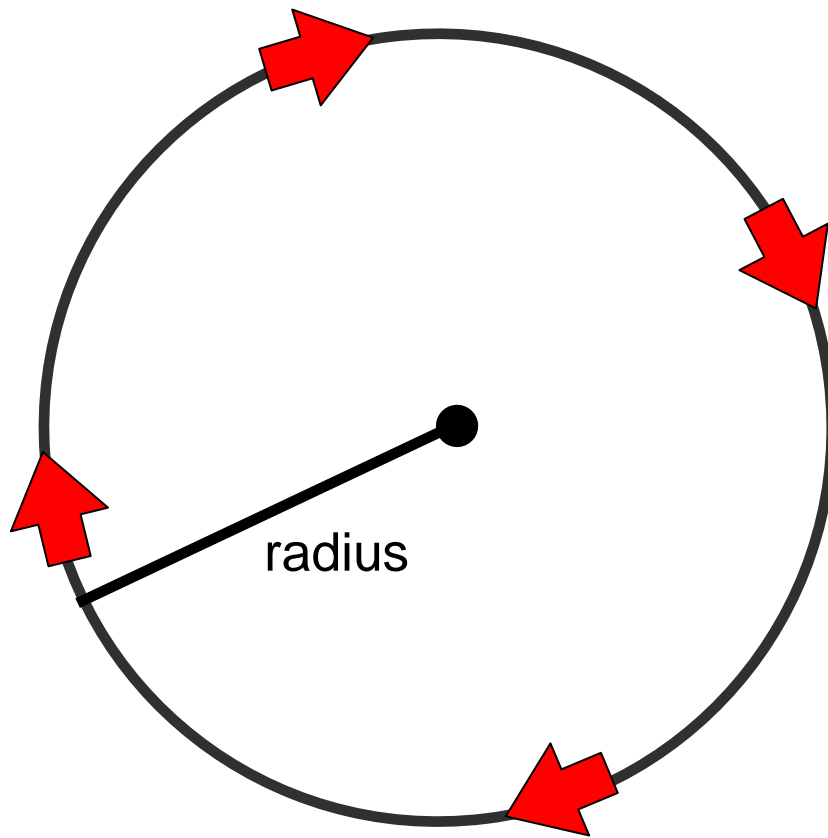
# Pi

$$\pi \approx 3.14159\dots$$



$$\pi = \frac{\text{circumference}}{\text{diameter}}$$

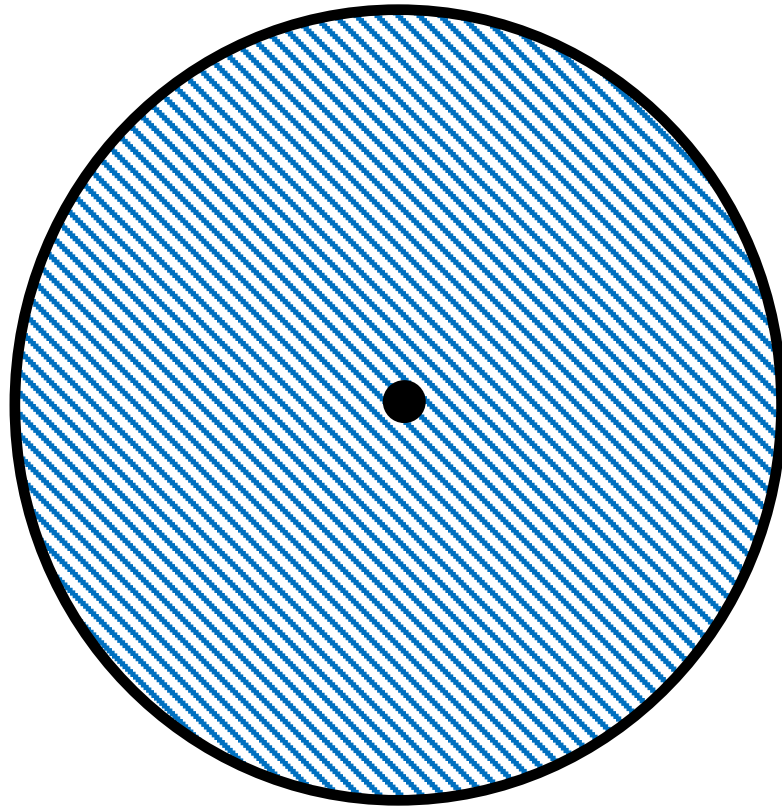
# Circumference



$$C = 2\pi r$$

**C** = perimeter of a circle

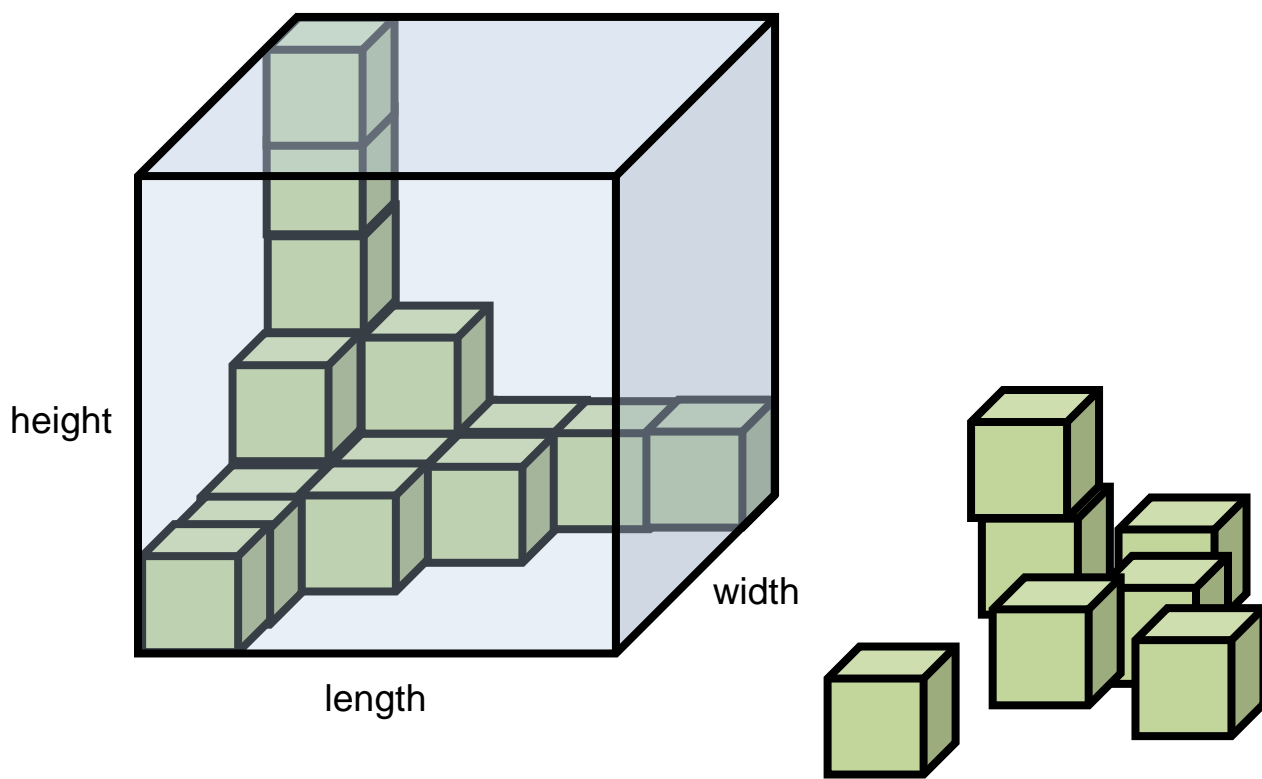
# Area of a Circle



$$A = \pi r^2$$



# Volume of a Prism

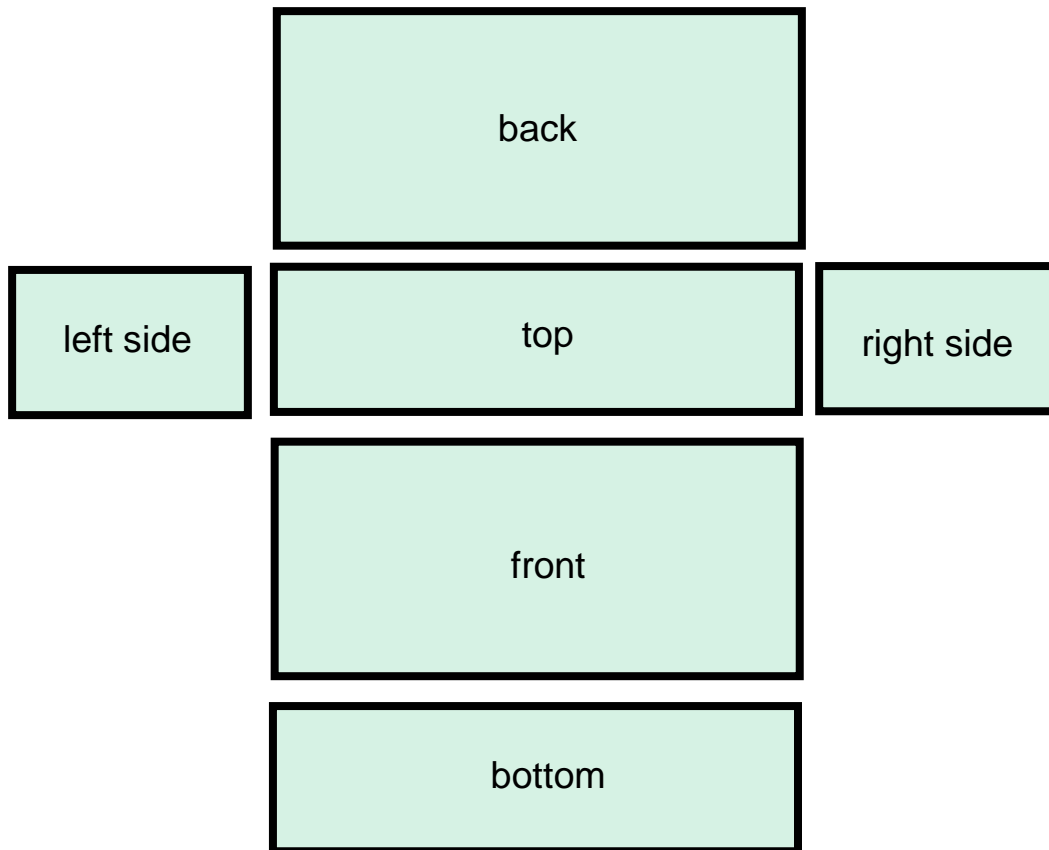
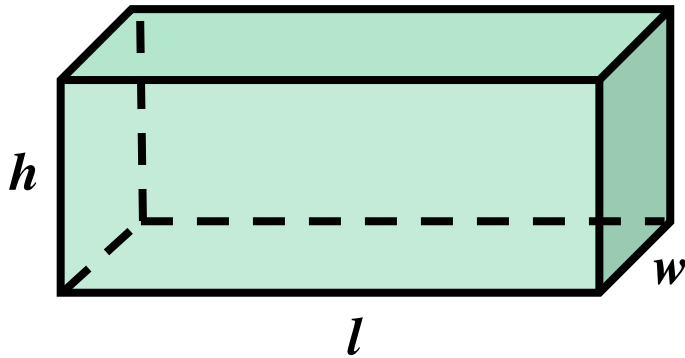


*Volume = length x width x height*

$$V = lwh$$

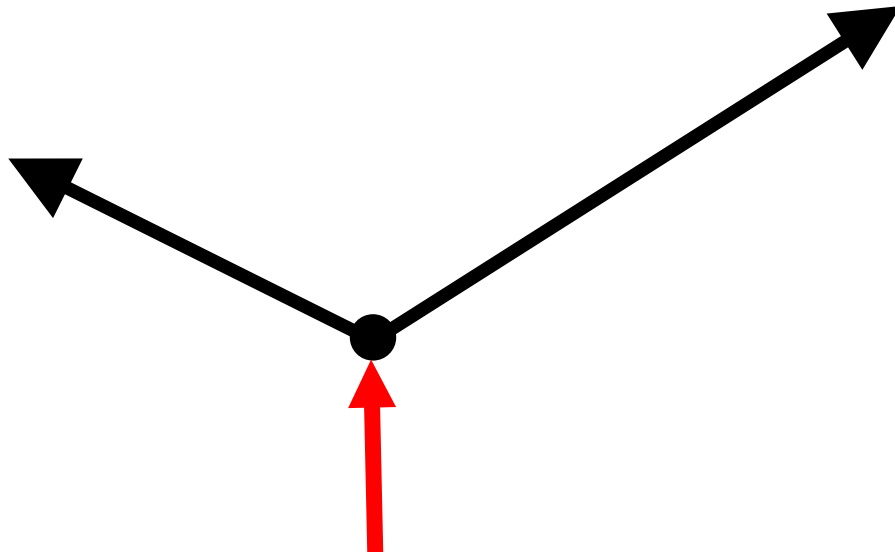
measured in cubic units

# Surface Area

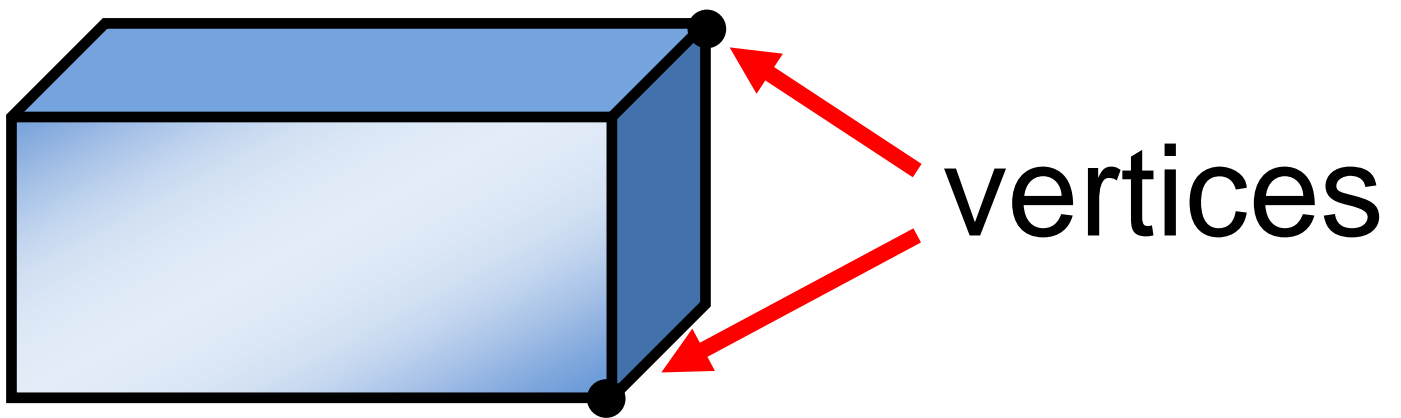


**Surface Area (S.A.) = sum of areas of faces**

# Vertex

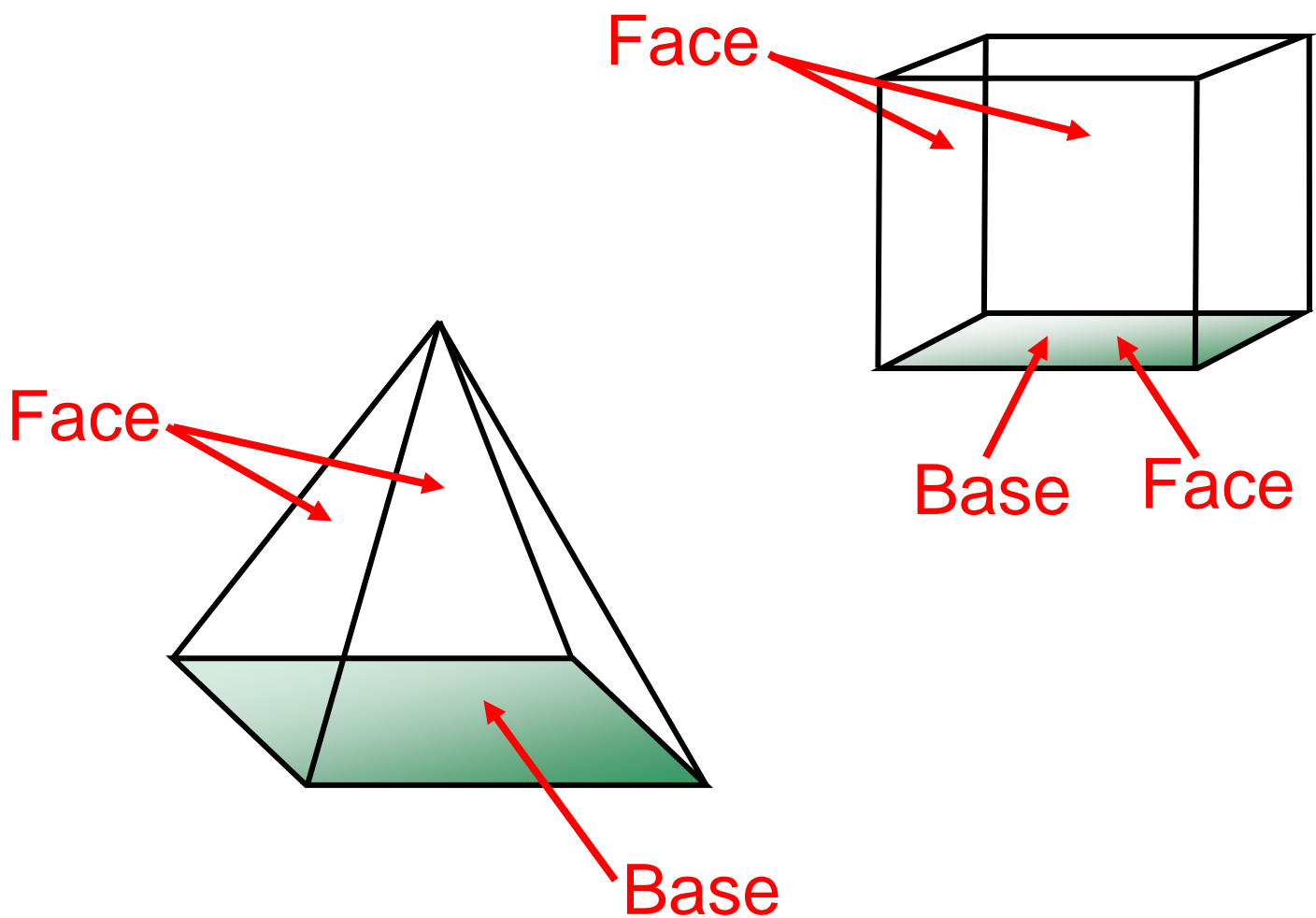


vertex

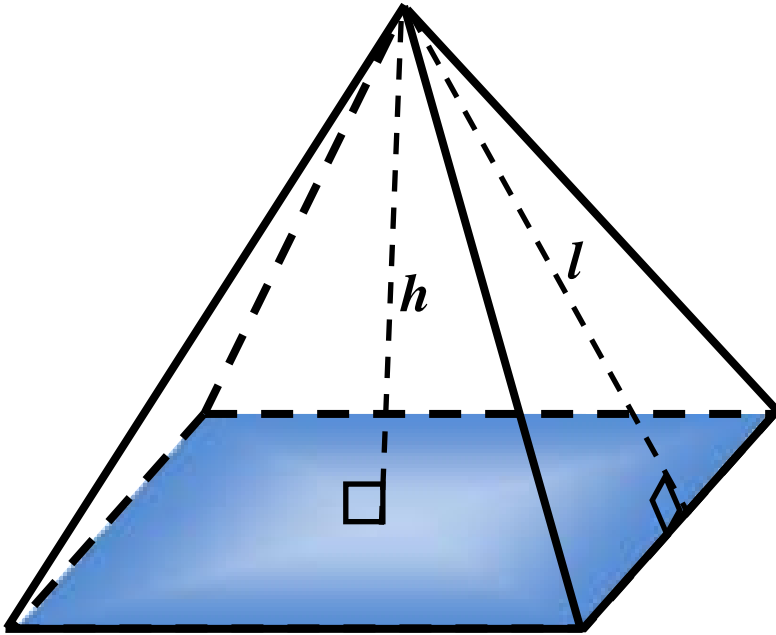


vertices

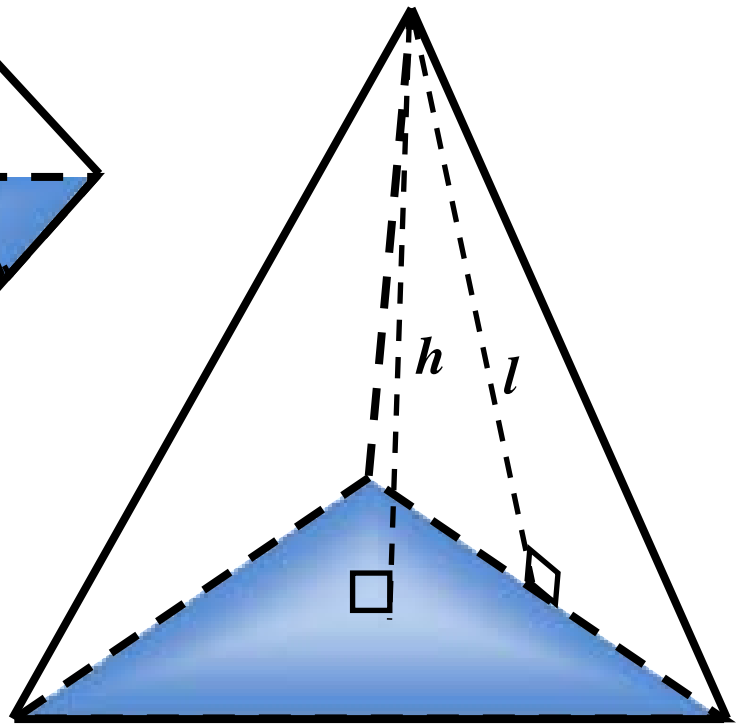
# Face and Base



# Pyramid



$B$  = area of base  
 $p$  = perimeter of base

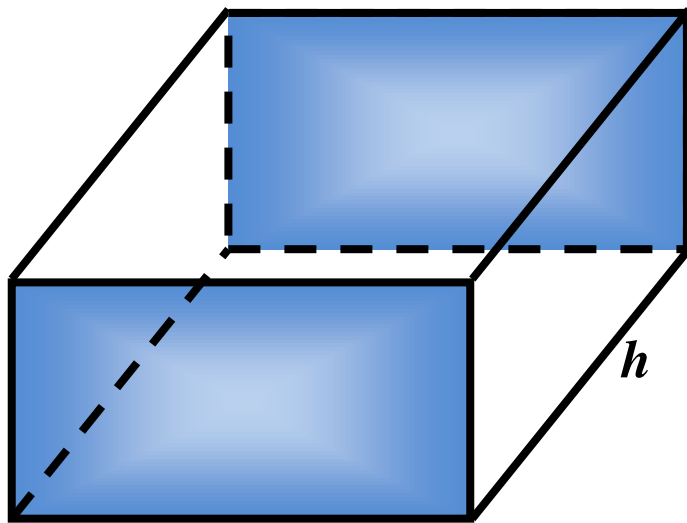


$B$  = area of base  
 $p$  = perimeter of base

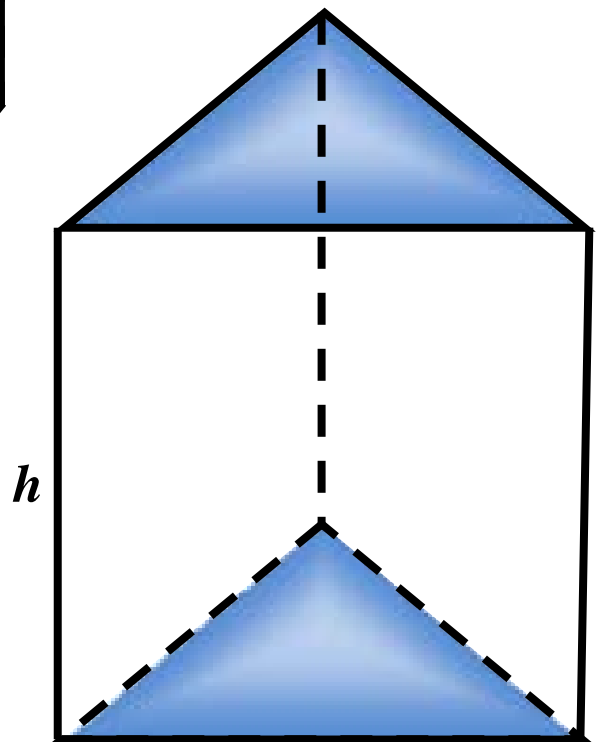
$$V = \frac{1}{3}Bh$$

$$S.A. = \frac{1}{2}lp + B$$

# Prism



$B = \text{area of base}$   
 $p = \text{perimeter of base}$

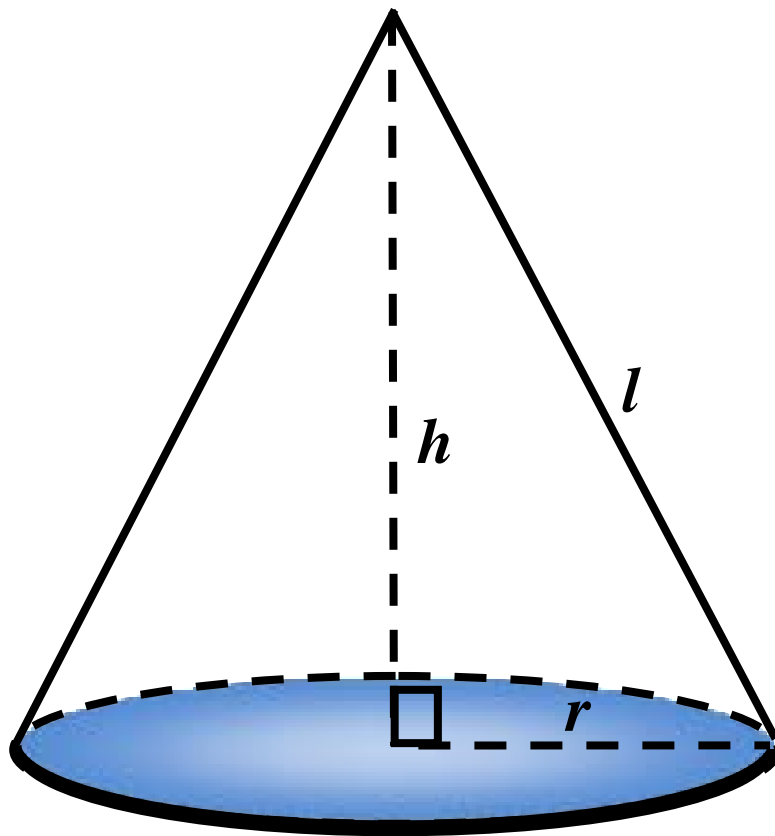


$B = \text{area of base}$   
 $p = \text{perimeter of base}$

$$V = Bh$$

$$S.A. = hp + 2B$$

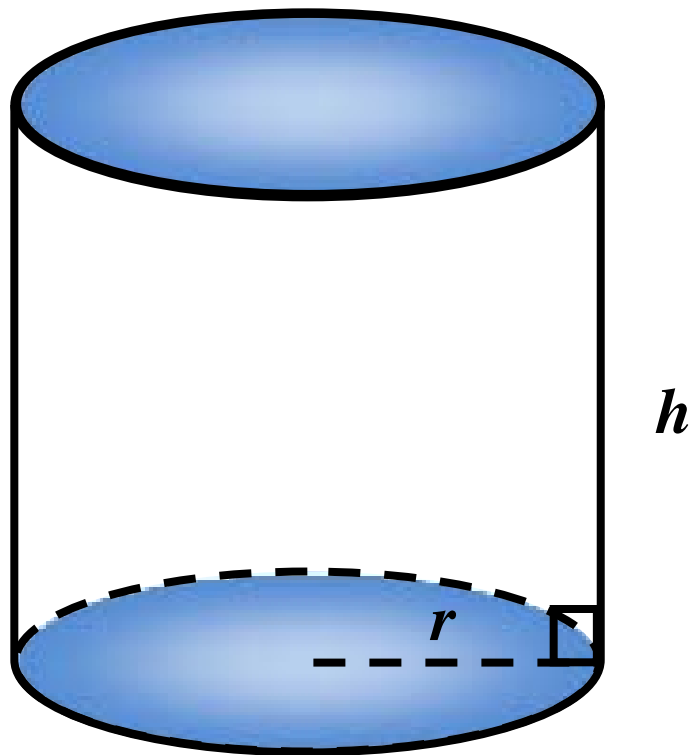
# Cone



$$V = \frac{1}{3}\pi r^2 h$$

$$S.A. = \pi r^2 + \pi r l$$

# Cylinder



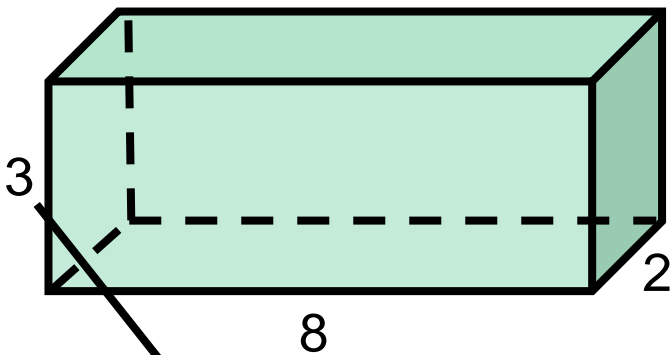
$$V = \pi r^2 h$$

$$S.A. = 2\pi r^2 + 2\pi r h$$

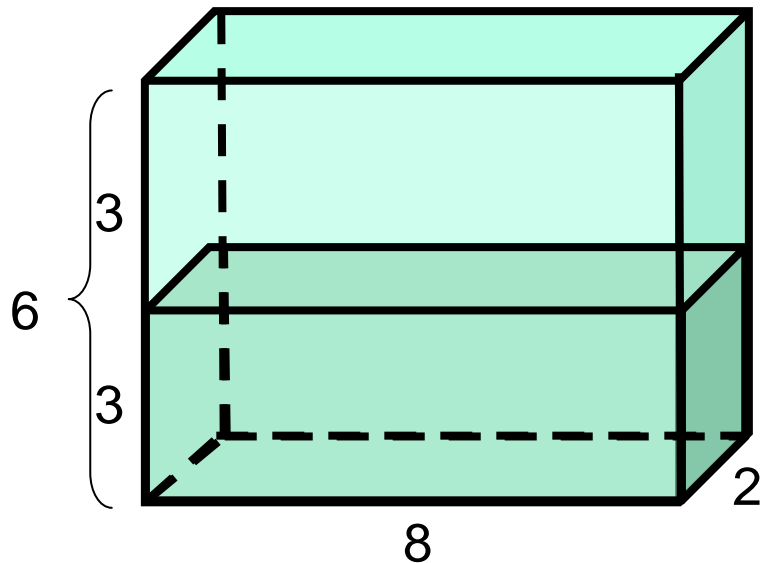


# Volume

## Changing one attribute



Height increases to 6



What happens to the volume?

# Complementary Angles

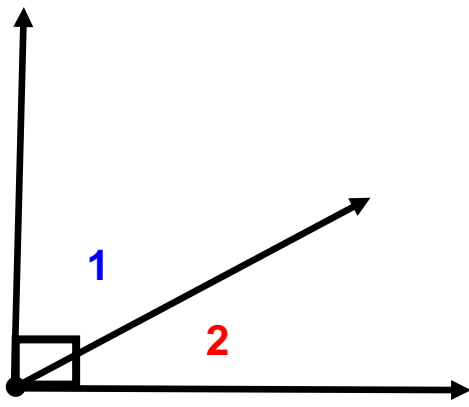


Fig 1

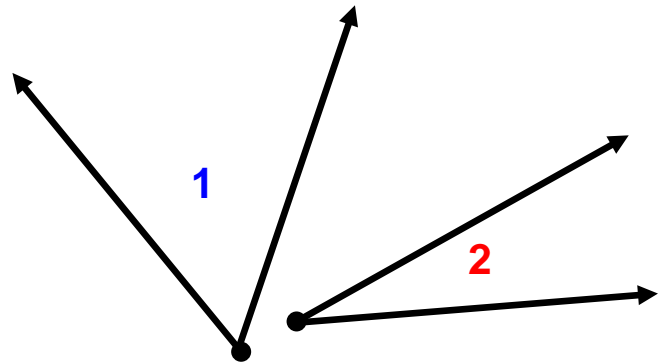
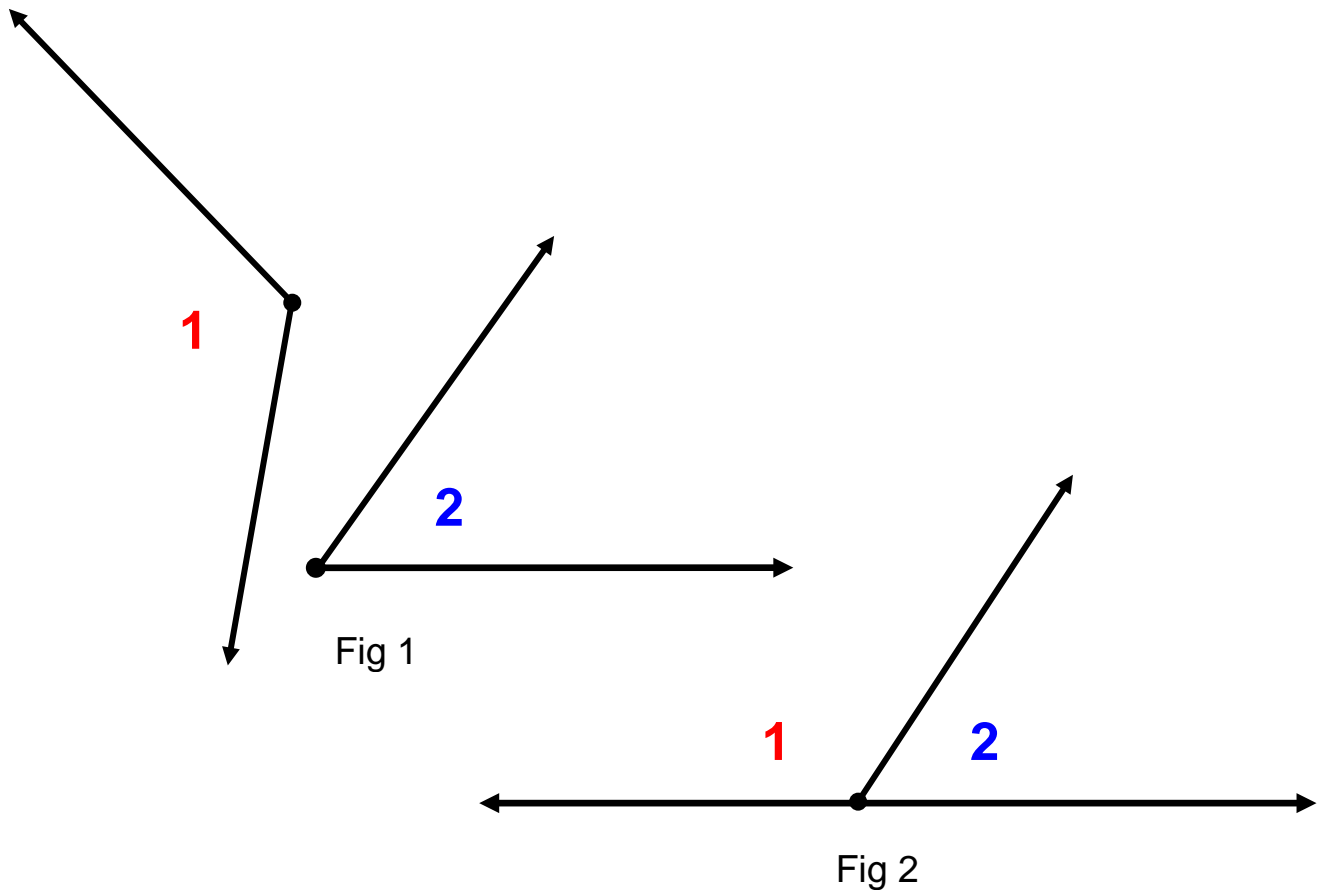


Fig 2

$$m\angle 1 + m\angle 2 = 90^\circ$$

in each figure

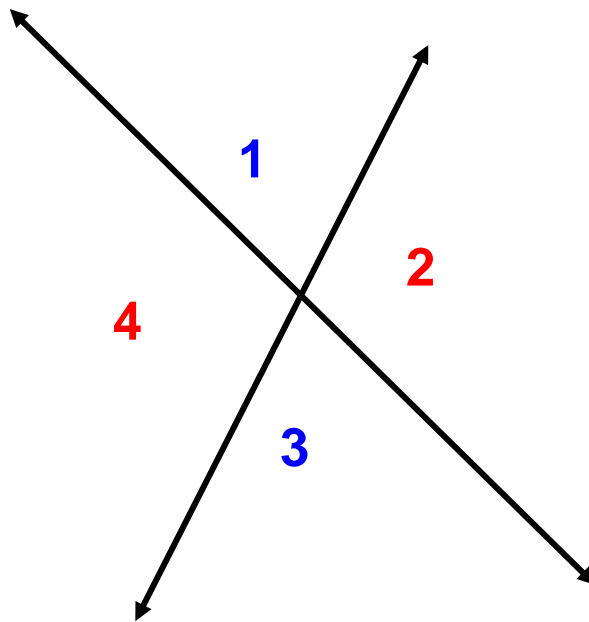
# Supplementary Angles



$$m\angle 1 + m\angle 2 = 180^\circ$$

in each figure

# Vertical Angles

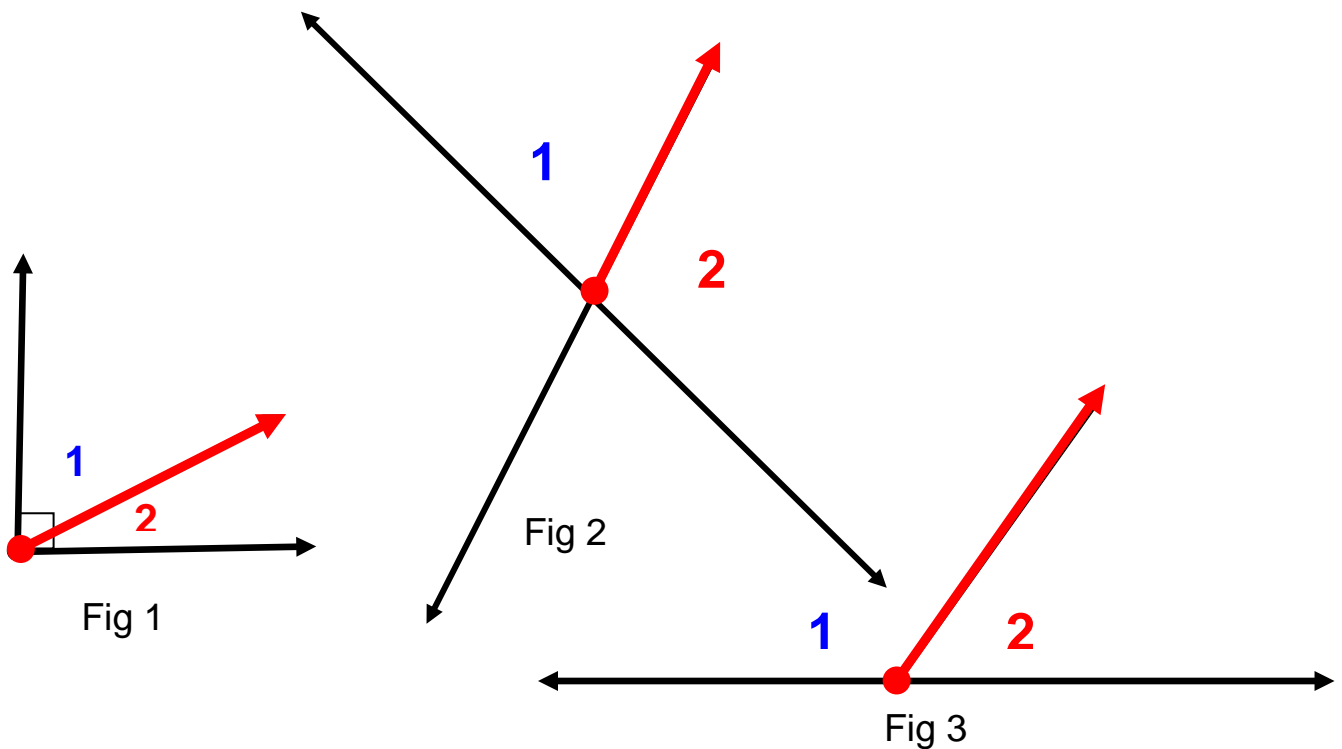


$\angle 1$  and  $\angle 3$  are vertical angles.  
 $\angle 2$  and  $\angle 4$  are vertical angles.

$$\angle 1 \cong \angle 3 \text{ and } \angle 2 \cong \angle 4$$

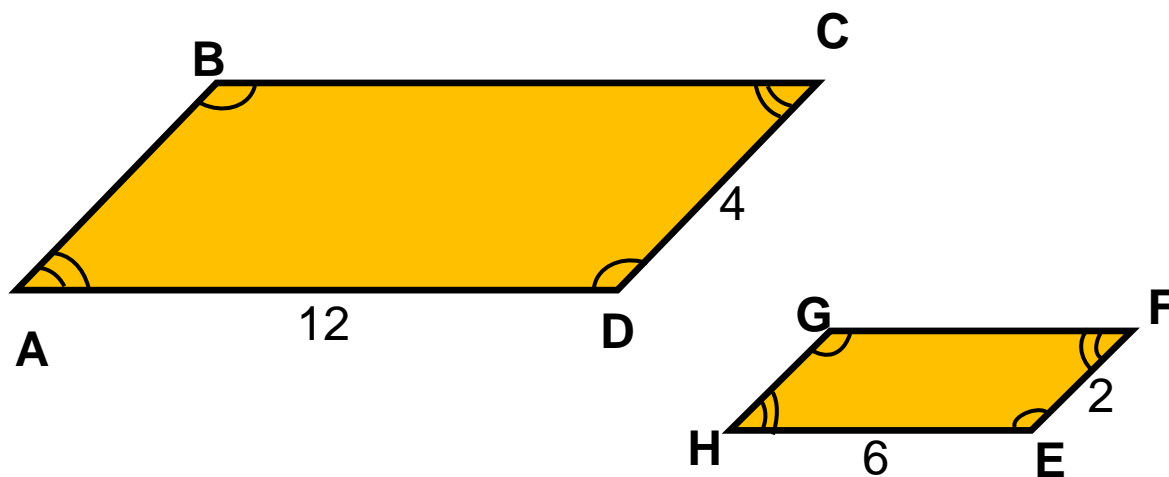
# Adjacent Angles

$\angle 1$  is adjacent to  $\angle 2$   
in each figure



Share a common side and a  
common vertex

# Similar Figures

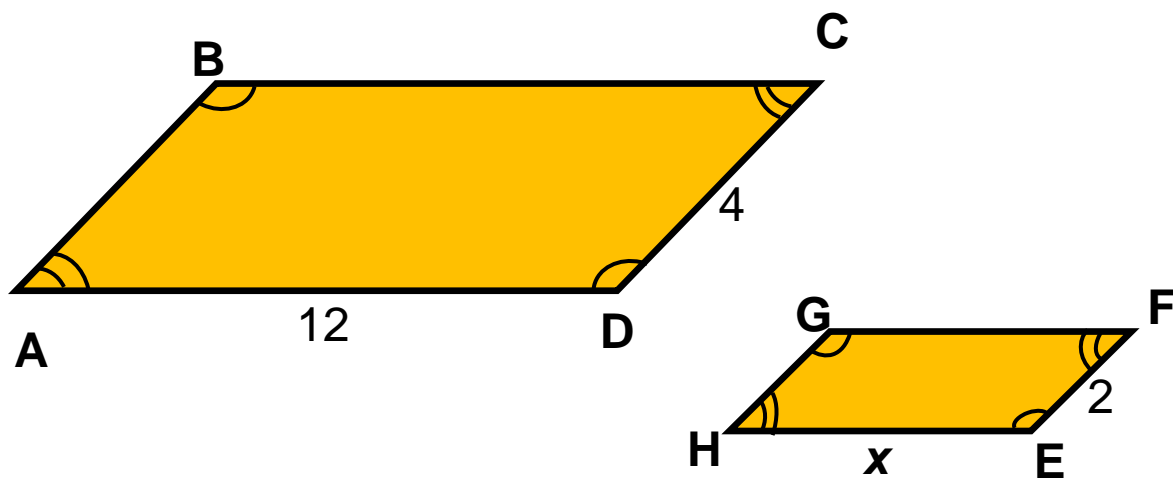


$$ABCD \sim HGFE$$

Angles	Sides
$\angle A$ corresponds to $\angle H$	$\overline{AB}$ corresponds to $\overline{HG}$
$\angle B$ corresponds to $\angle G$	$\overline{BC}$ corresponds to $\overline{GF}$
$\angle C$ corresponds to $\angle F$	$\overline{CD}$ corresponds to $\overline{FE}$
$\angle D$ corresponds to $\angle E$	$\overline{DA}$ corresponds to $\overline{EH}$

Corresponding angles are **congruent**.  
 Corresponding sides are **proportional**.

# Similar Figures and Proportions



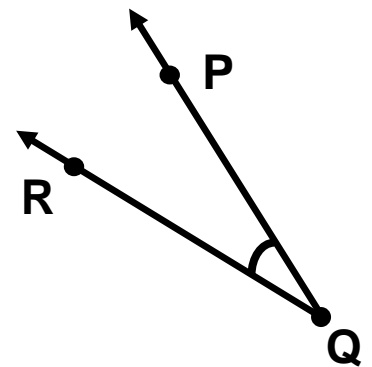
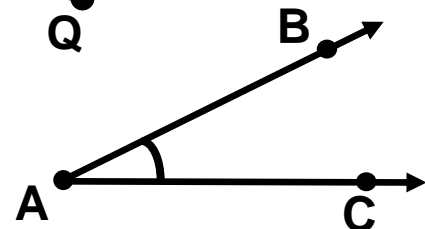
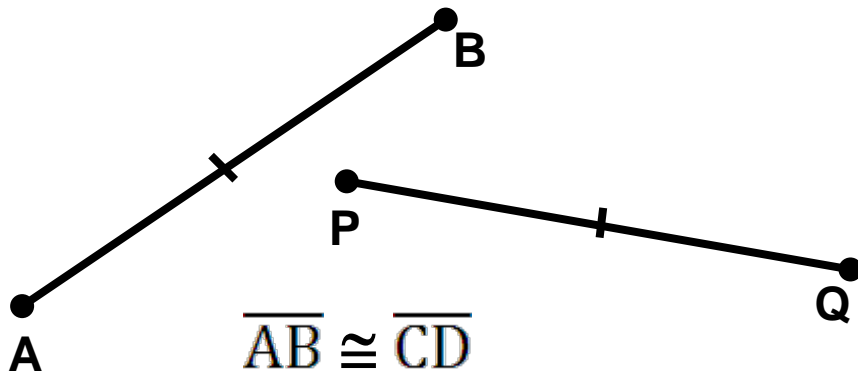
$$ABCD \sim HGFE$$

$$\frac{DC}{EF} = \frac{AD}{HE}$$

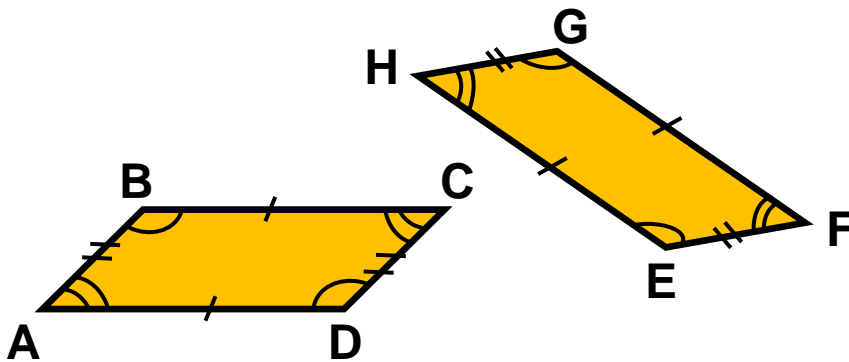
$$\frac{4}{2} = \frac{12}{x}$$

# Congruent Figures

have exactly the  
same shape and size



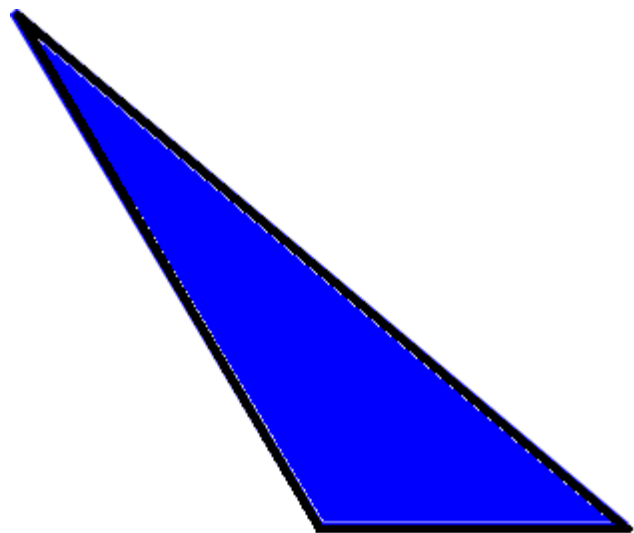
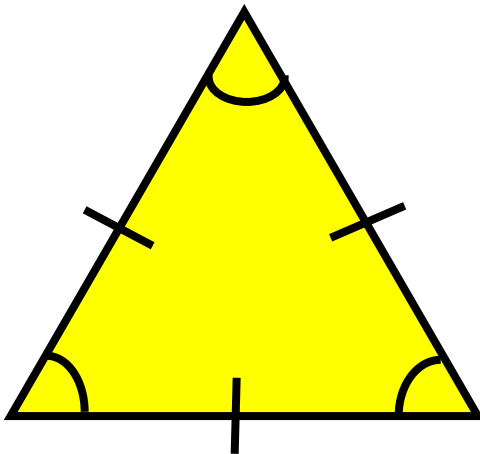
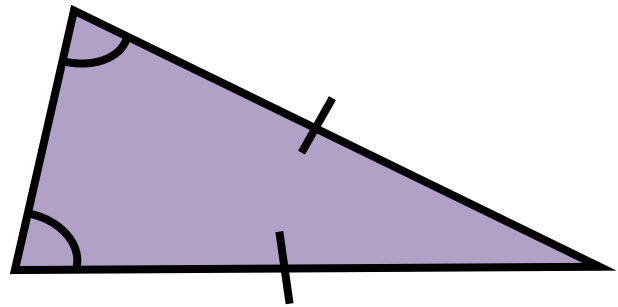
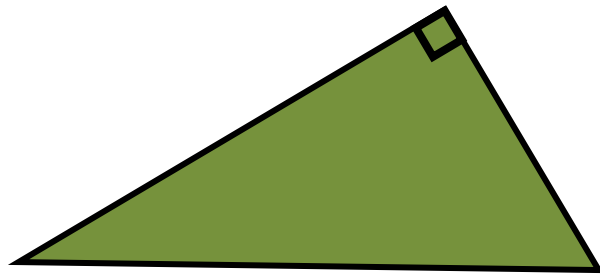
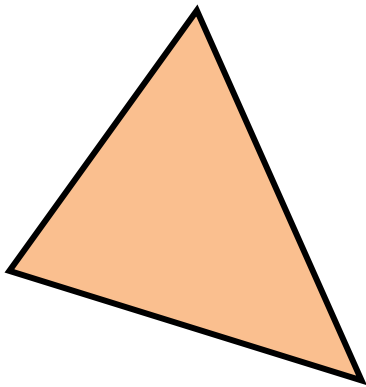
$$\angle BAC \cong \angle PQR$$



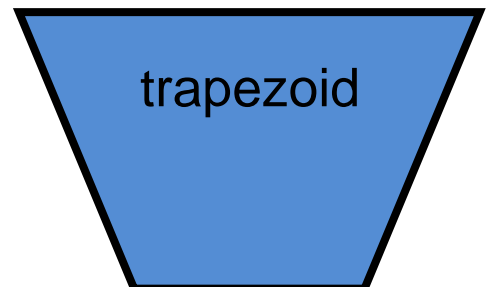
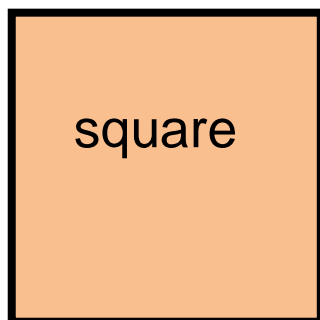
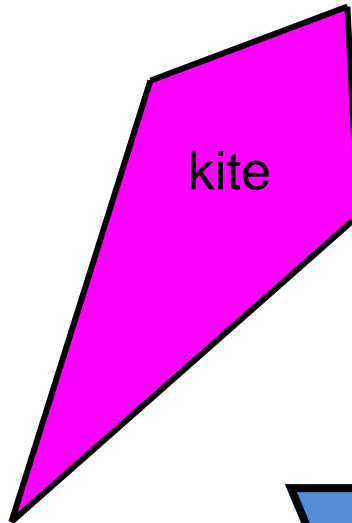
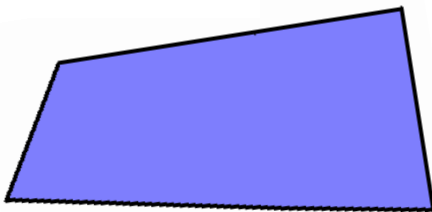
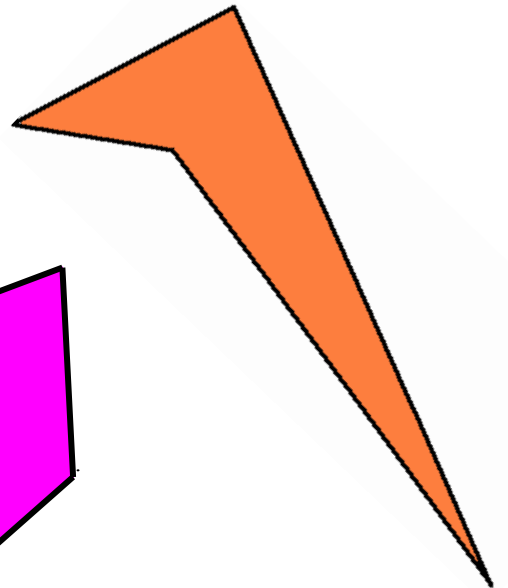
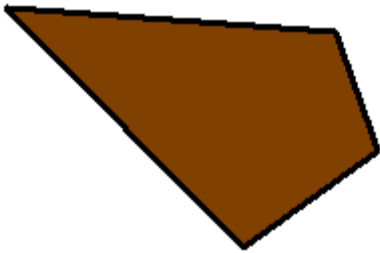
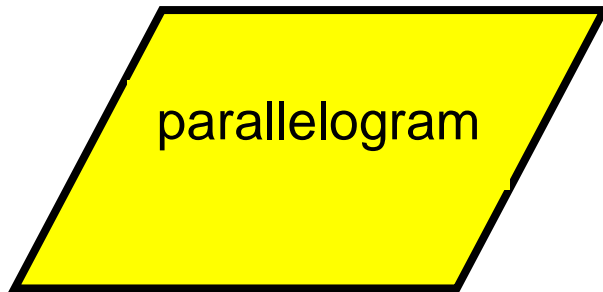
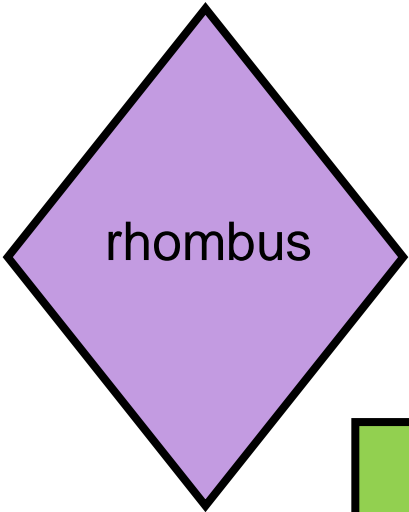
$$\square ABCD \cong \square HGFE$$



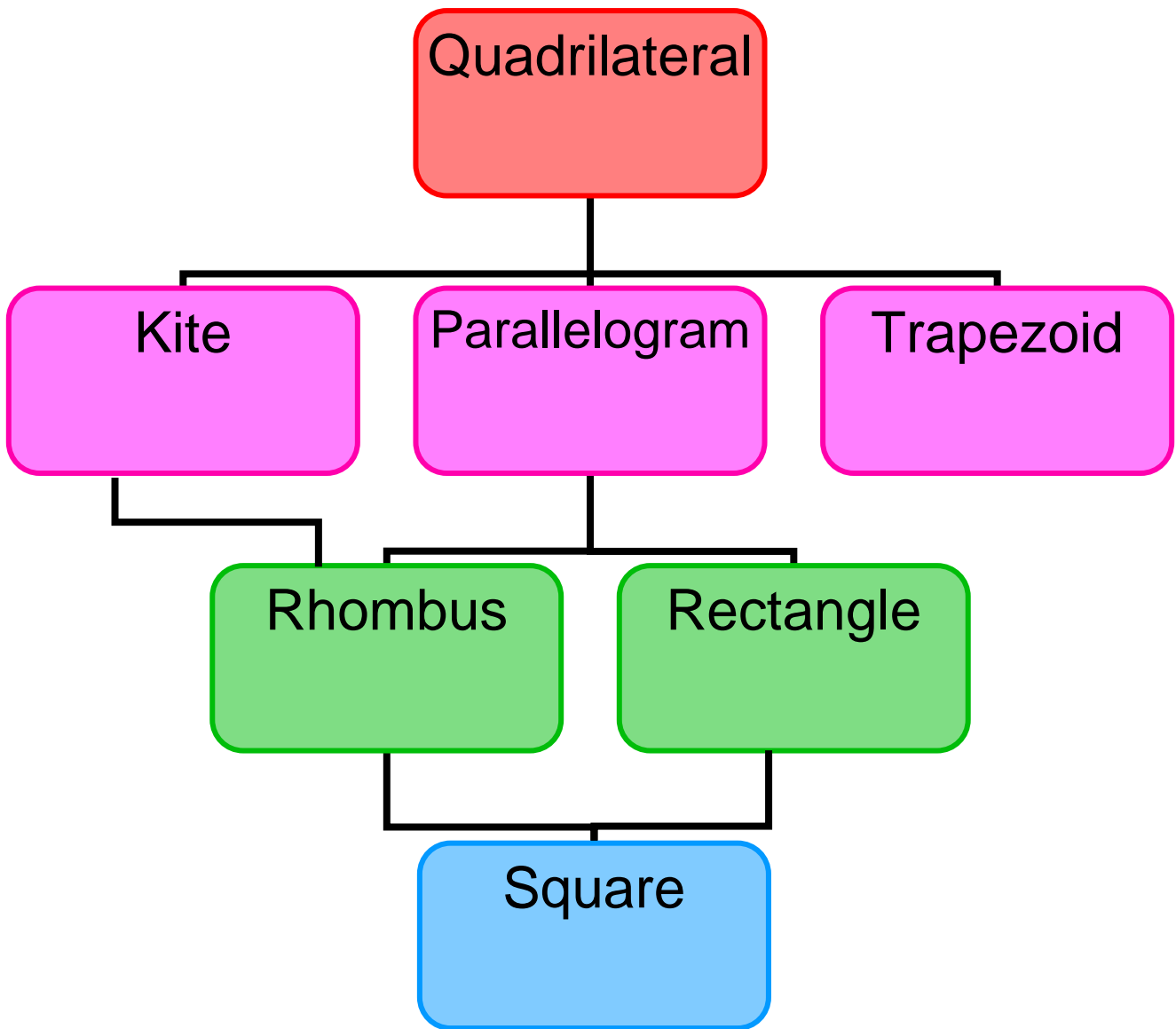
# Triangles



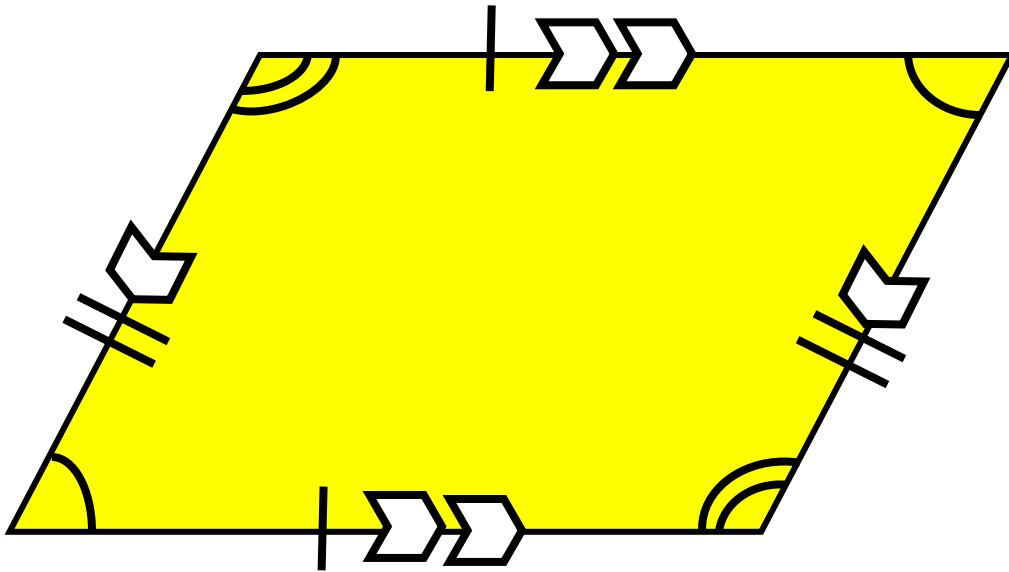
# Quadrilaterals



# Quadrilaterals Relationships

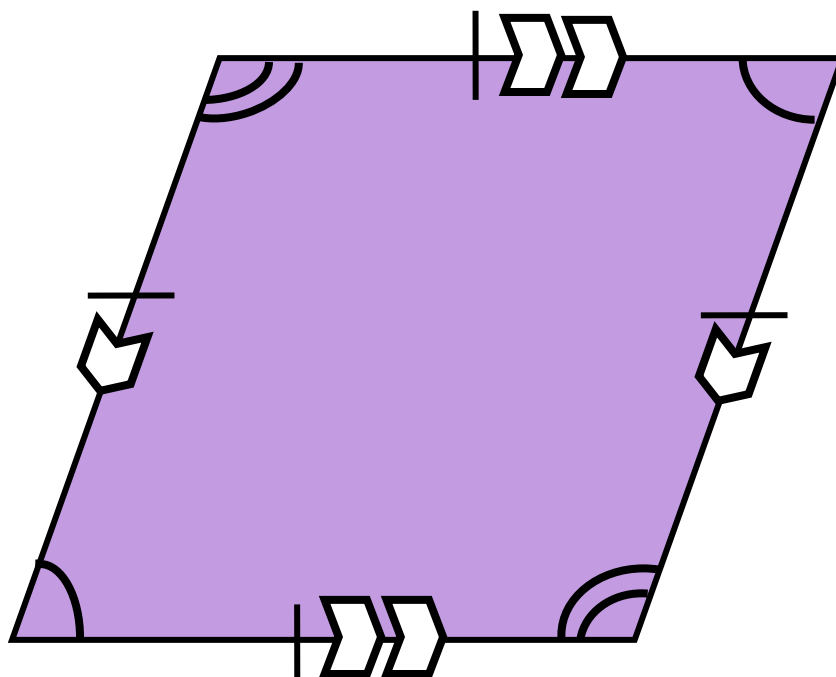


# Parallelogram



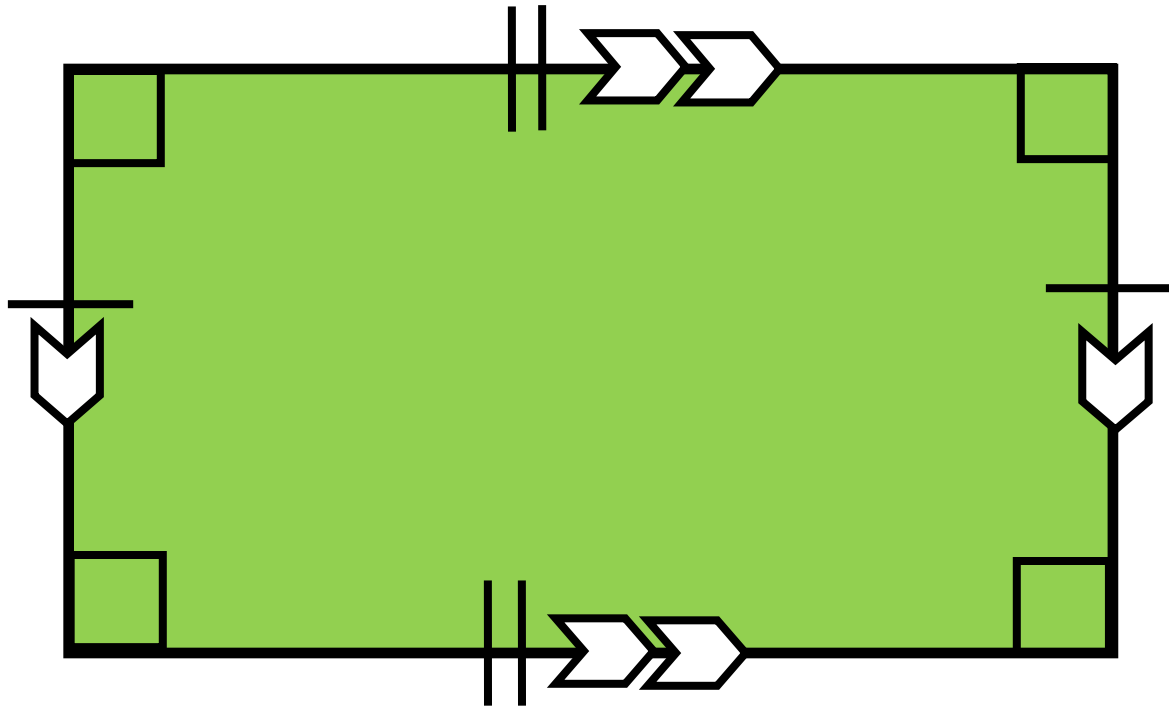
- opposite angles are congruent
- 2 pairs of parallel sides
- 2 pairs of opposite sides congruent

# Rhombus



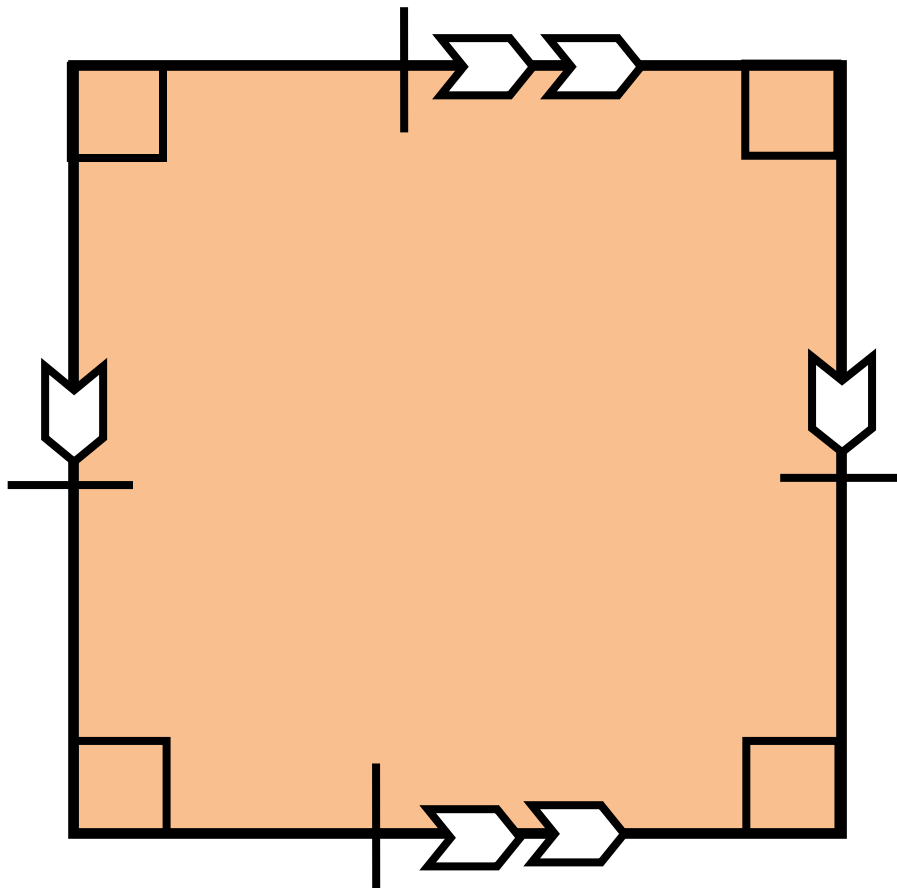
- opposite angles are congruent
- 2 pairs of parallel sides
- 4 congruent sides

# Rectangle



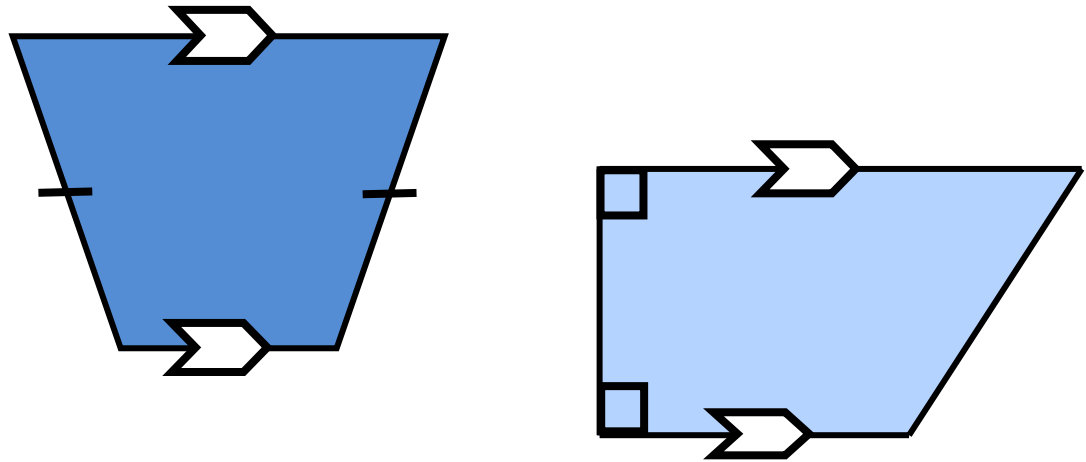
- 4 right angles
- 2 pairs of parallel sides
- 2 pairs of opposite sides congruent

# Square



- 4 right angles
- 2 pairs of parallel sides
- 4 congruent sides

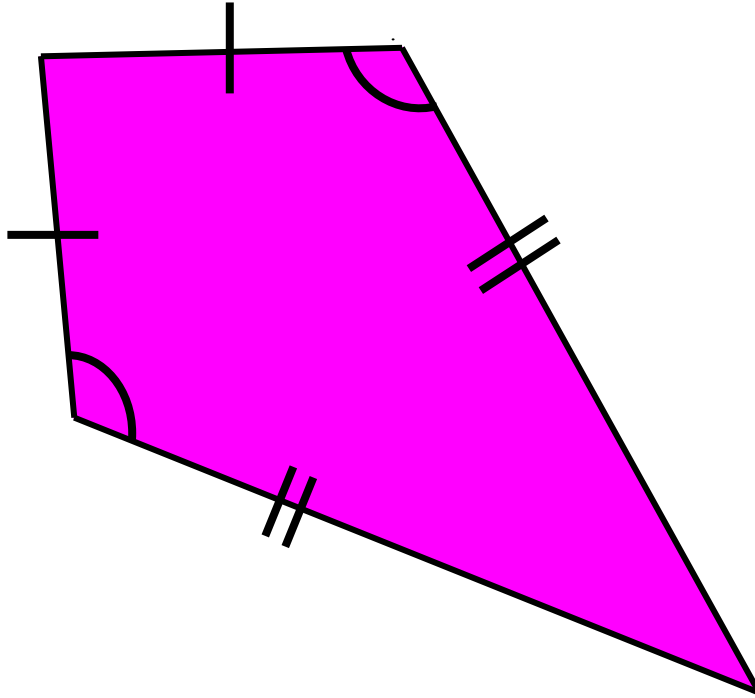
# Trapezoid



- may have zero or two right angles
- exactly one pair of parallel sides
- may have one pair of congruent sides

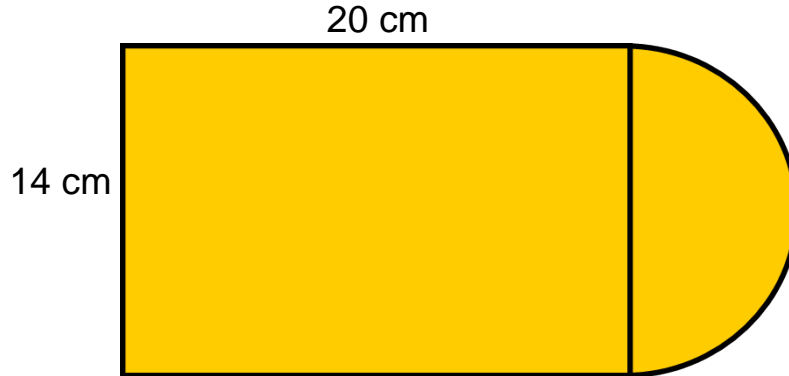


# Kite

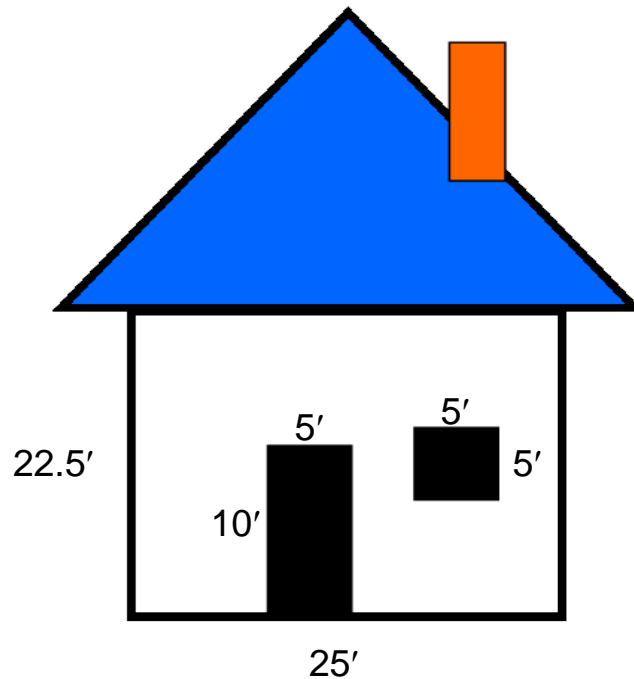


- one pair of opposite congruent angles
- 2 pairs of adjacent congruent sides

# Composite Figures

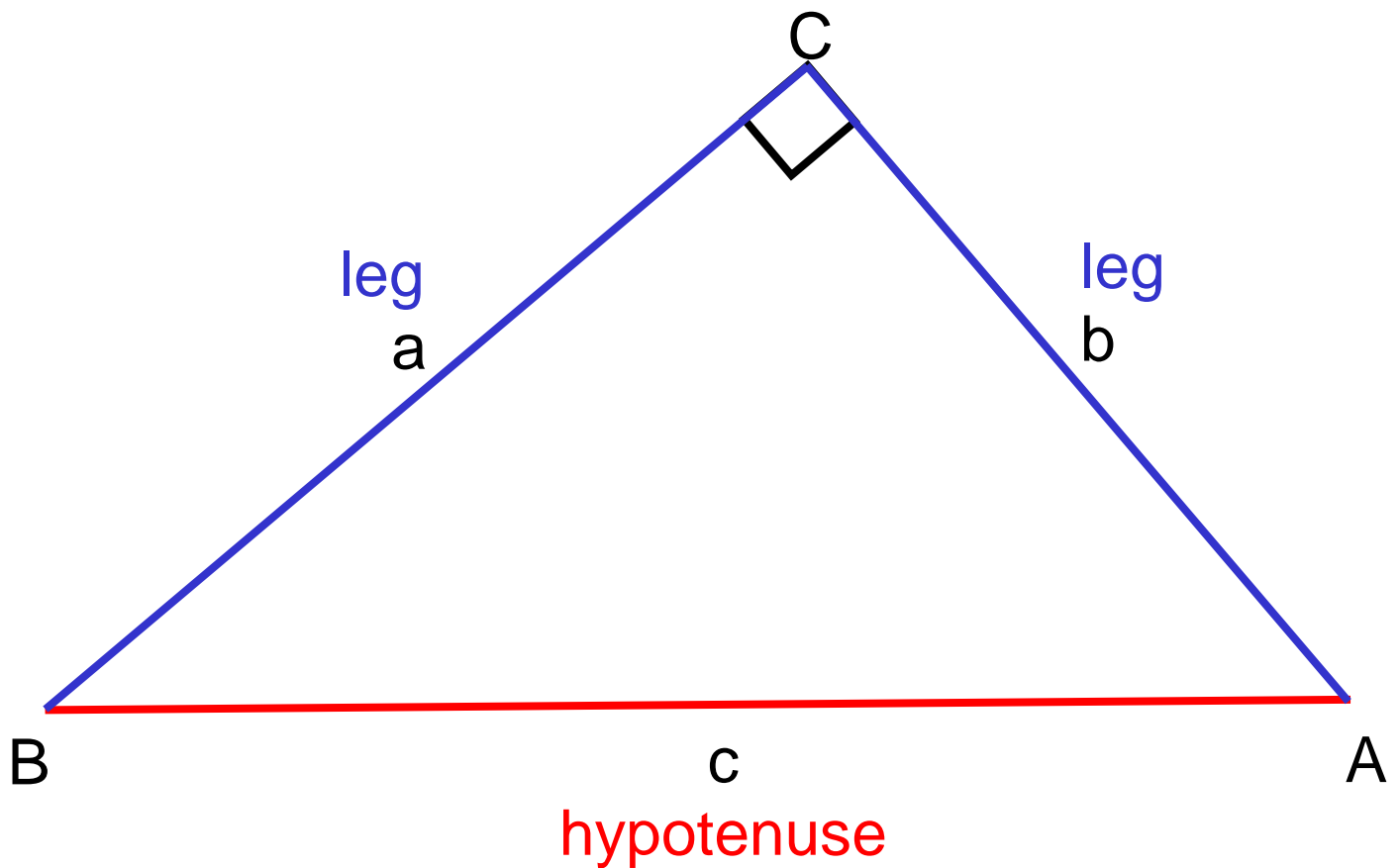


Subdivide into other figures then determine the perimeter.

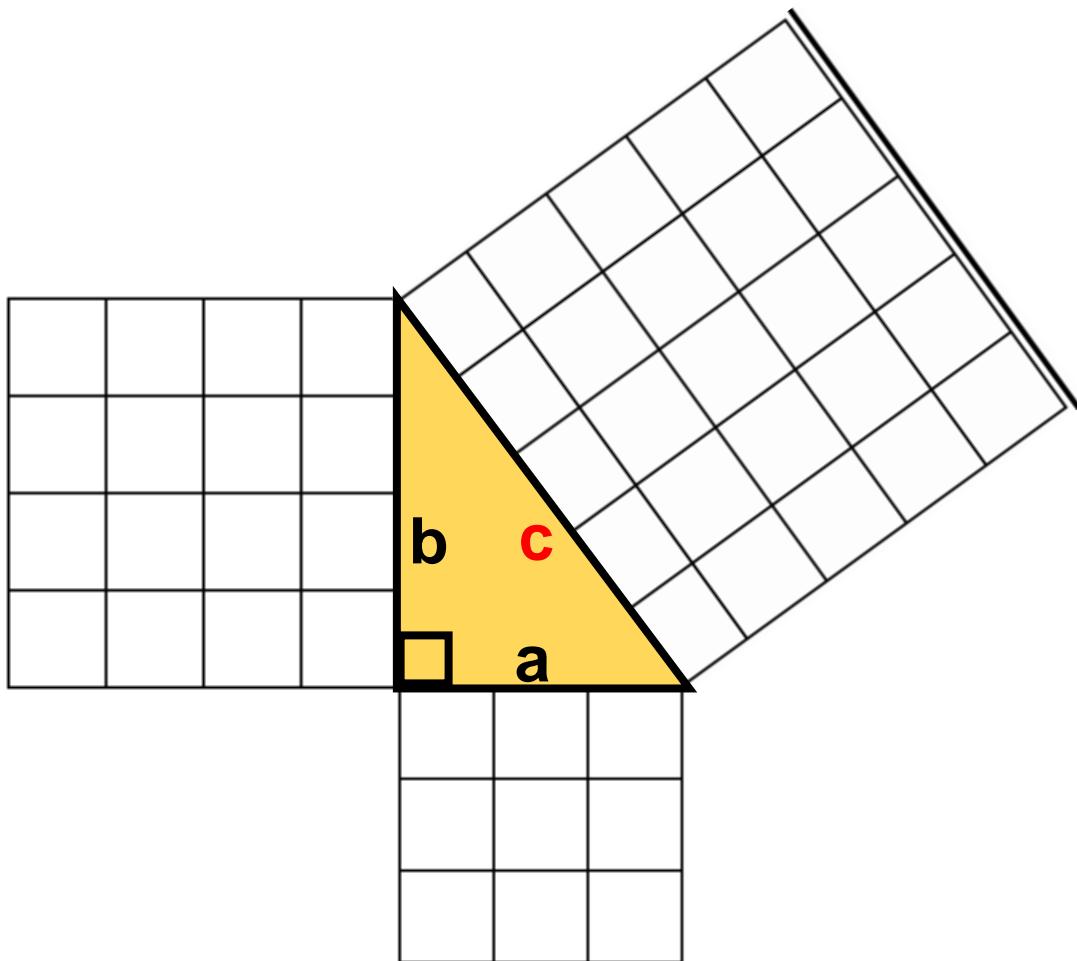


Subdivide into other figures then determine the area.

# Right Triangle

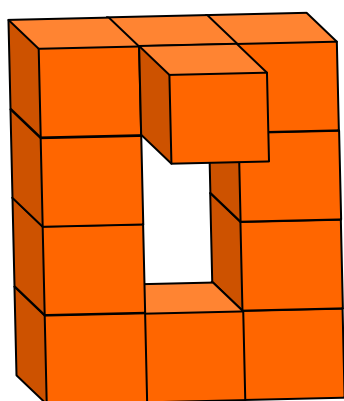


# Pythagorean Theorem

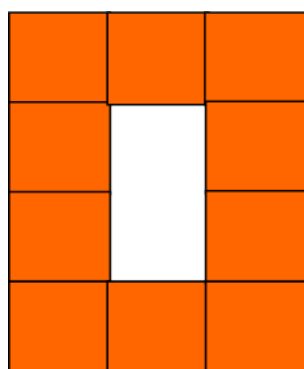


$$a^2 + b^2 = c^2$$

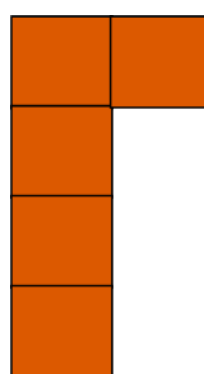
# Three Dimensional Models



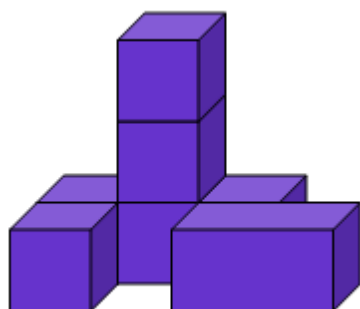
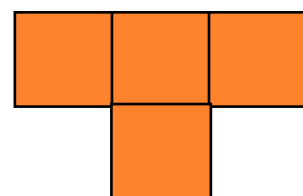
front



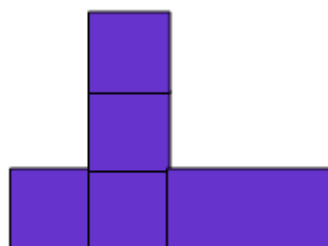
side



top



front



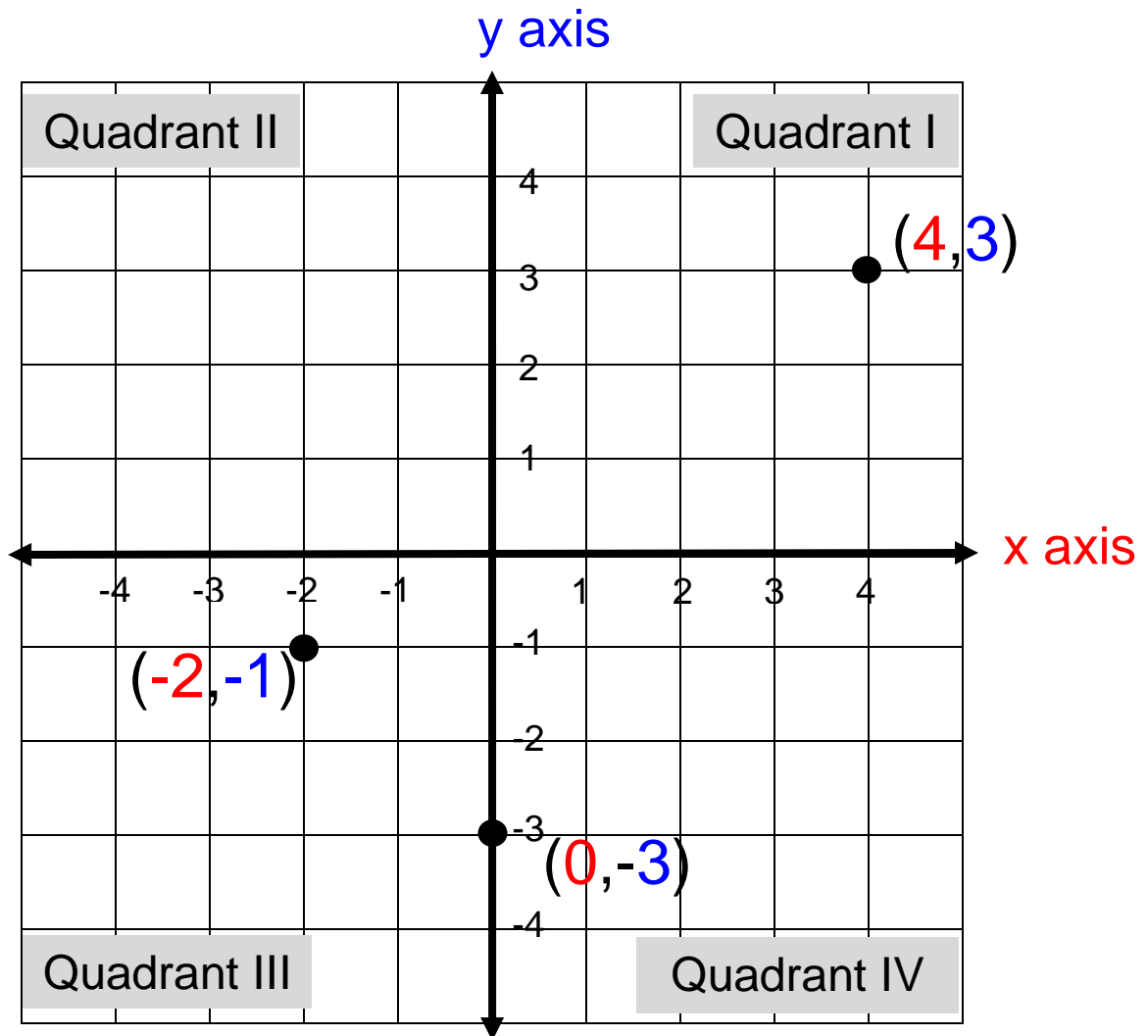
side



top

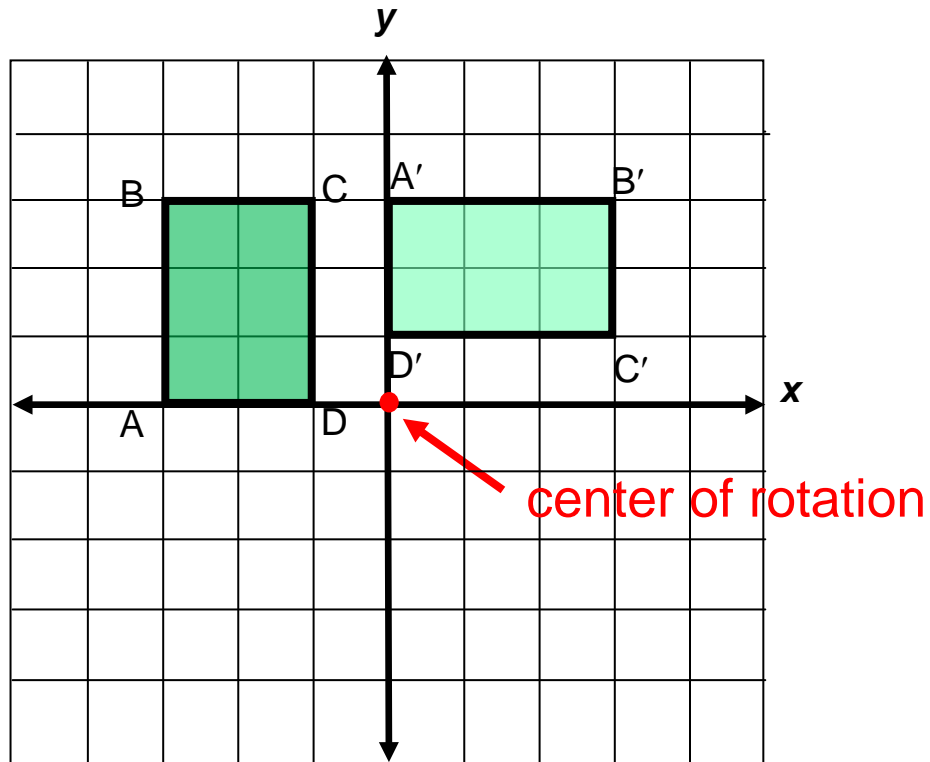


# Coordinate Plane



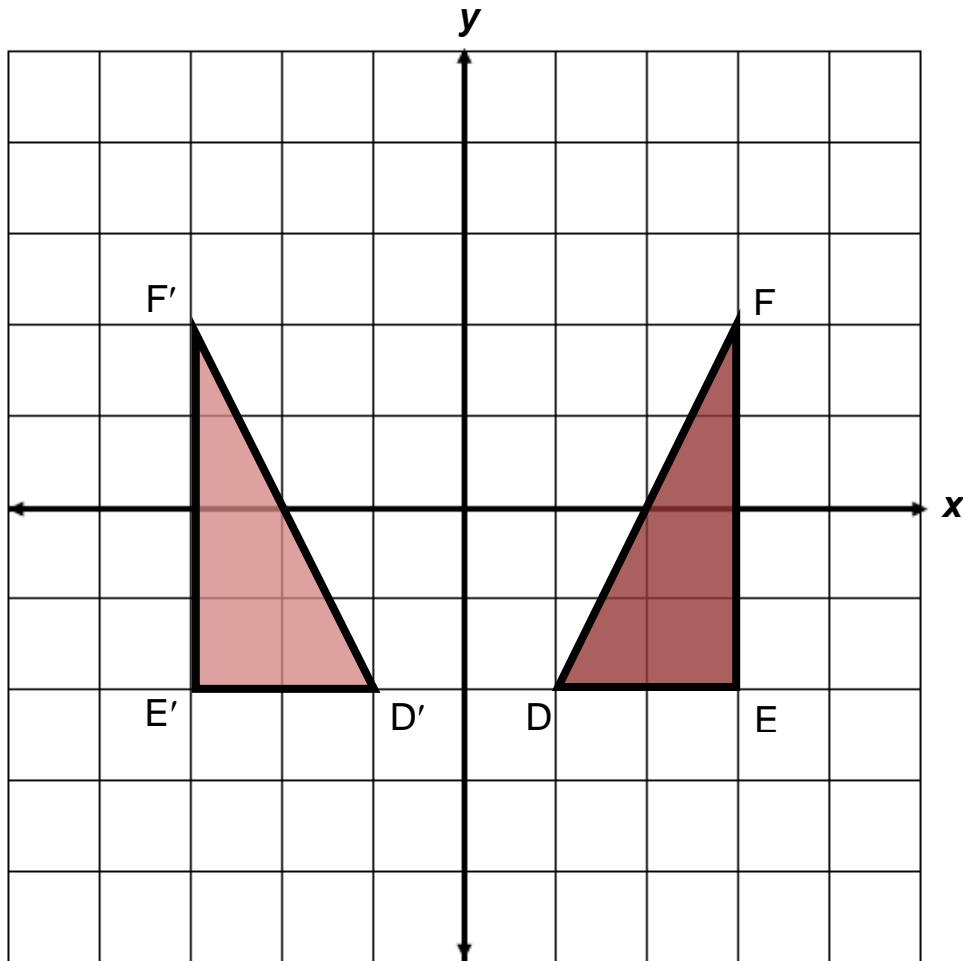
ordered pair  $(x, y)$

# Rotation



Preimage	Image
A(-3,0)	A'(0,3)
B(-3,3)	B'(3,3)
C(-1,3)	C'(3,1)
D(-1,0)	D'(0,1)

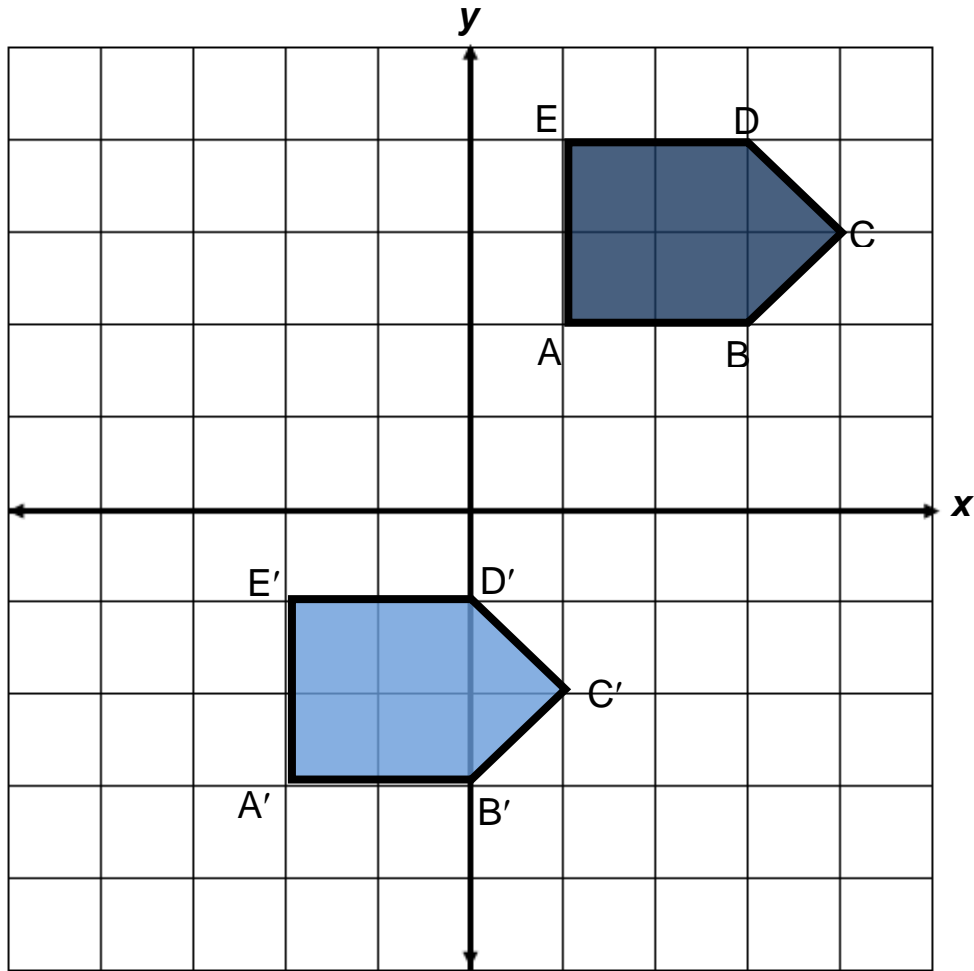
# Reflection



Preimage	Image
$D(1, -2)$	$D'(-1, -2)$
$E(3, -2)$	$E'(-3, -2)$
$F(3, 2)$	$F'(-3, 2)$

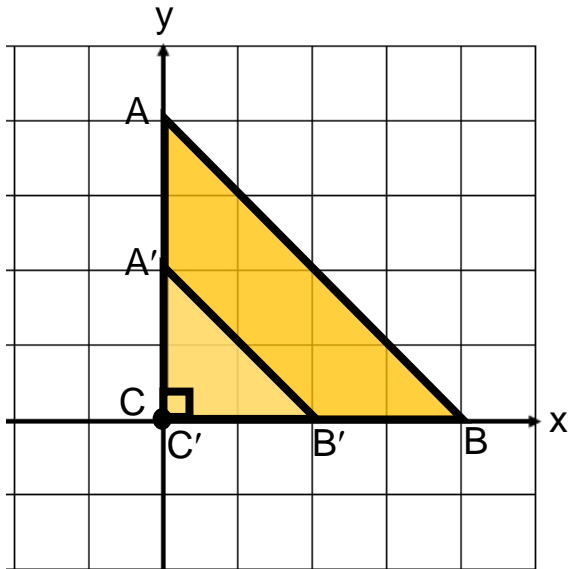


# Translation



Preimage	Image
A(1,2)	A'(-2,-3)
B(3,2)	B'(0,-3)
C(4,3)	C'(1,-2)
D(3,4)	D'(0,-1)
E(1,4)	E'(-2,-1)

# Dilation

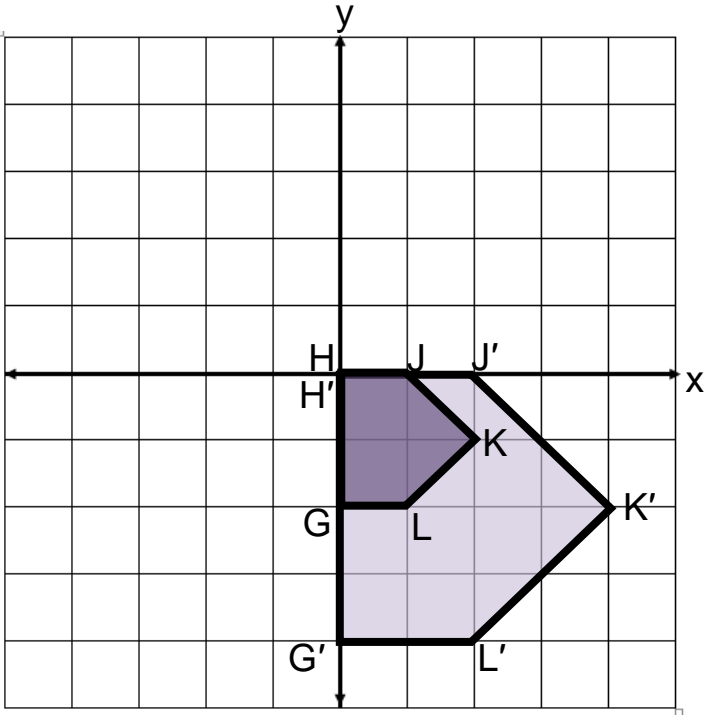


center of dilation =  $(0,0)$   
 scale factor =  $\frac{1}{2}$

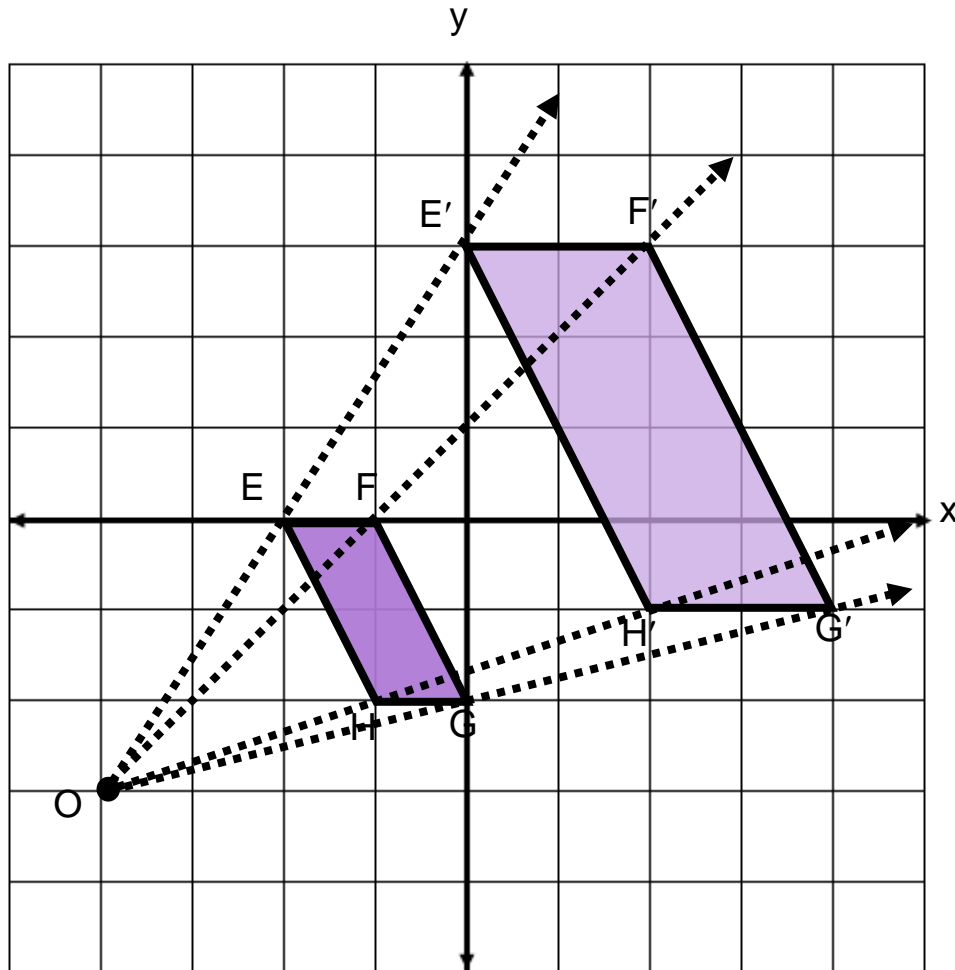
Preimage	Image
A(0,4)	A'(0,2)
B(4,0)	B'(2,0)
C(0,0)	C'(0,0)

center of dilation =  $(0,0)$   
 scale factor = 2

Preimage	Image
G(0,-2)	G'(0,-4)
H(0,0)	H'(0,0)
J(1,0)	J'(2,0)
K(2,-1)	K'(4,-2)
L(1,-2)	L'(2,-4)



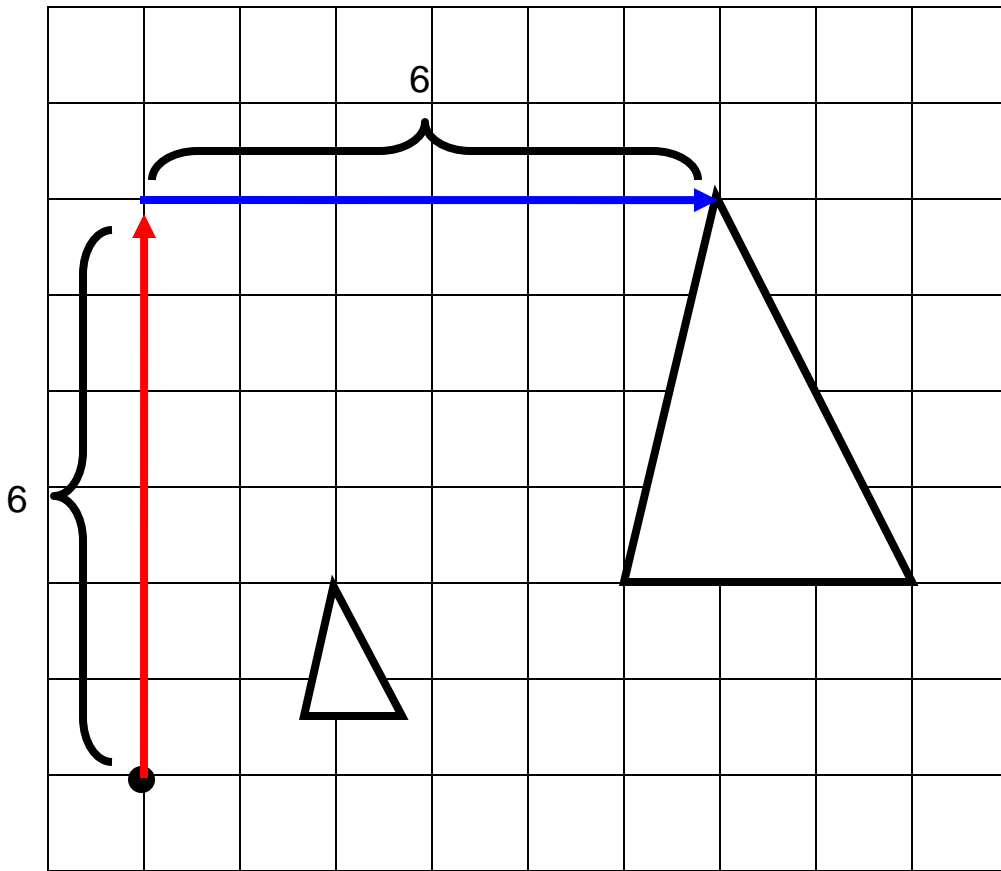
# Dilation



center of dilation =  $(-4, -3)$   
scale factor = 2

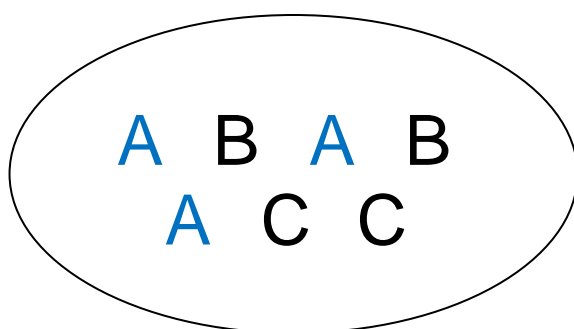
Preimage	Image
E(-2,0)	E'(0,3)
F(-1,0)	F'(2,3)
G(0, -2)	G'(4,-1)
H(-1,-2)	H'(2,-1)

# Dilation

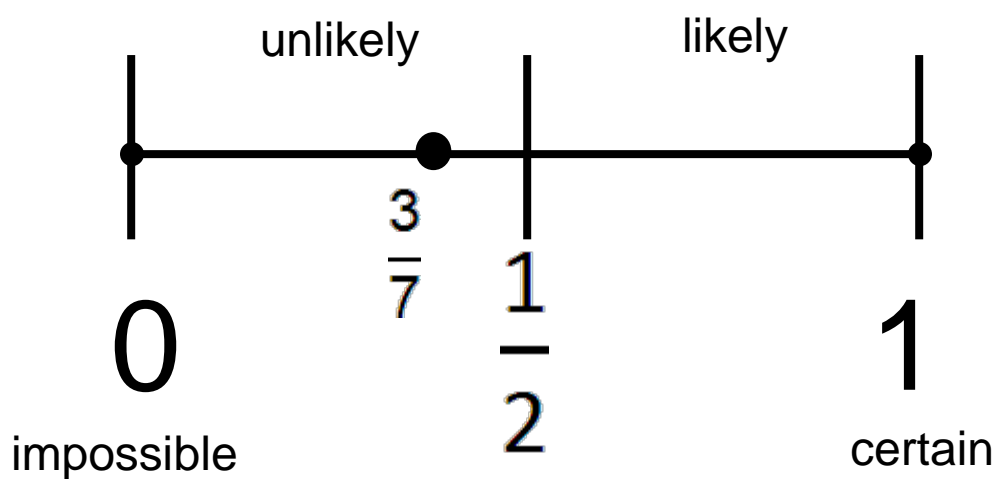


center of dilation = C  
scale factor =  $\frac{1}{3}$

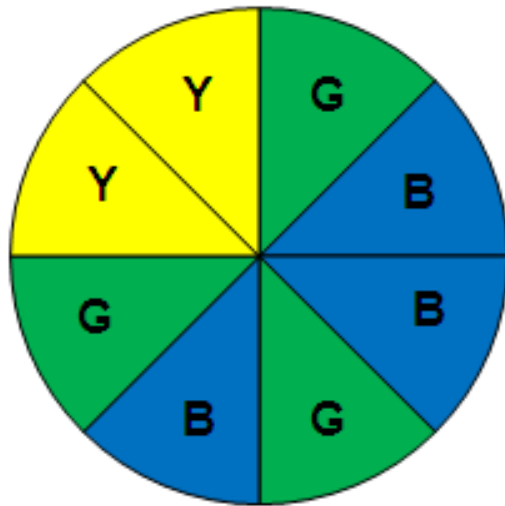
# Probability



$$P(A) = \frac{3}{7}$$



# Probability of Independent Events



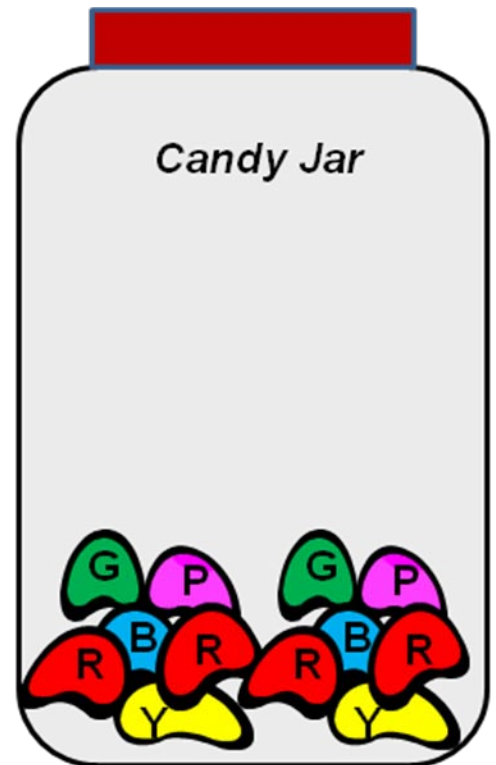
$$P(\text{green}) = \frac{3}{8}$$

$$P(\text{yellow}) = \frac{2}{8} = \frac{1}{4}$$

$$P(\text{green and yellow}) = P(\text{green}) \cdot P(\text{yellow}) = \frac{3}{8} \cdot \frac{1}{4} = \frac{3}{32}$$

# Probability of Dependent Events

What is the probability of getting a **red** jelly bean on first pick and then without replacing it, getting a **green** jelly bean on the second pick?



$$P(\text{red}) \cdot P(\text{green after red}) =$$

$$\frac{4}{12} \cdot \frac{2}{11} = \frac{8}{132} = \frac{2}{33}$$

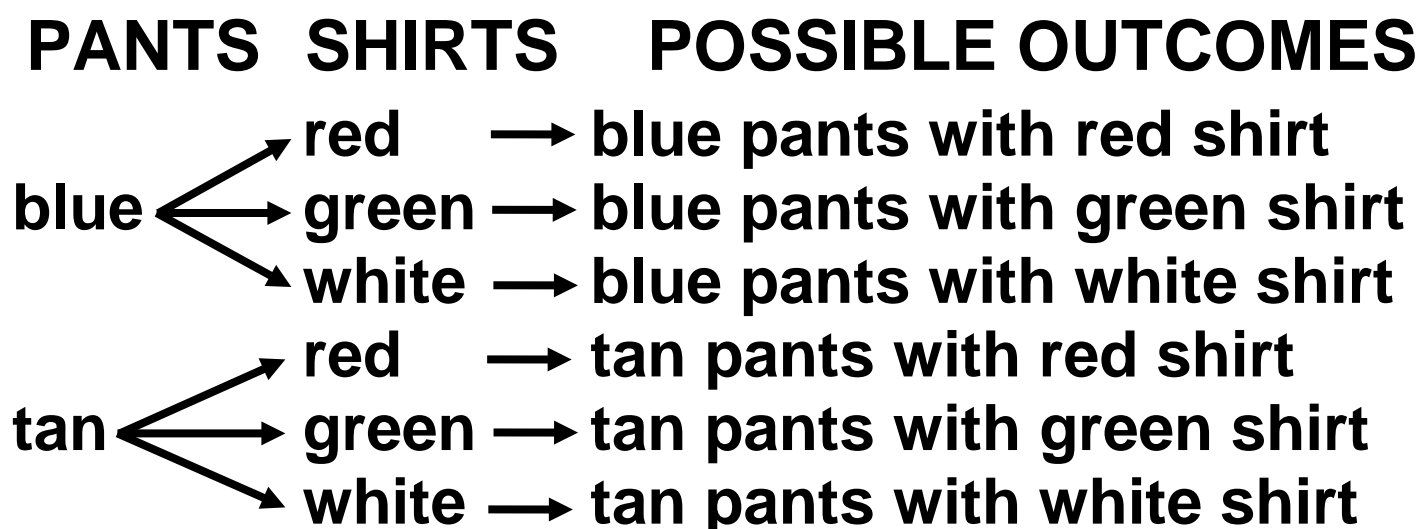
# Fundamental Counting Principle

If there are  $m$  ways for one event to occur and  $n$  ways for a second event to occur, then there are  $m \cdot n$  ways for both events to occur.



# Tree Diagram

Joe has two pairs of pants (blue and tan). He also has three shirts (red, green and white). List the possible outfits that Joe can make.



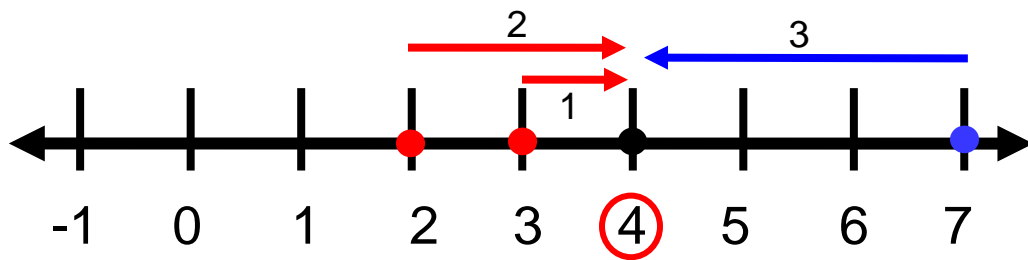
**2 · 3 or 6 possible outcomes**

# Mean

a measure of central tendency

2, 3, 4, 7

## Balance Point



## Numerical Average

$$\frac{2 + 3 + 4 + 7}{4} = \frac{16}{4} = 4$$

# Median

a measure of central tendency

6, 7, 8, 9, 9



8 = median

5, 6, 8, 9, 11, 12

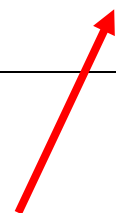


8.5 = median

# Mode

a measure of central tendency

Data Sets	Mode
2, 3, 3, 3, 5, 5, 9, 10	3
5.2, 5.4, 5.5, 5.6, 5.8, 5.9, 6.0	none
1, 1, 2, 5, 6, 7, 7, 9, 11, 12	1, 7



bimodal

# Range

Data set

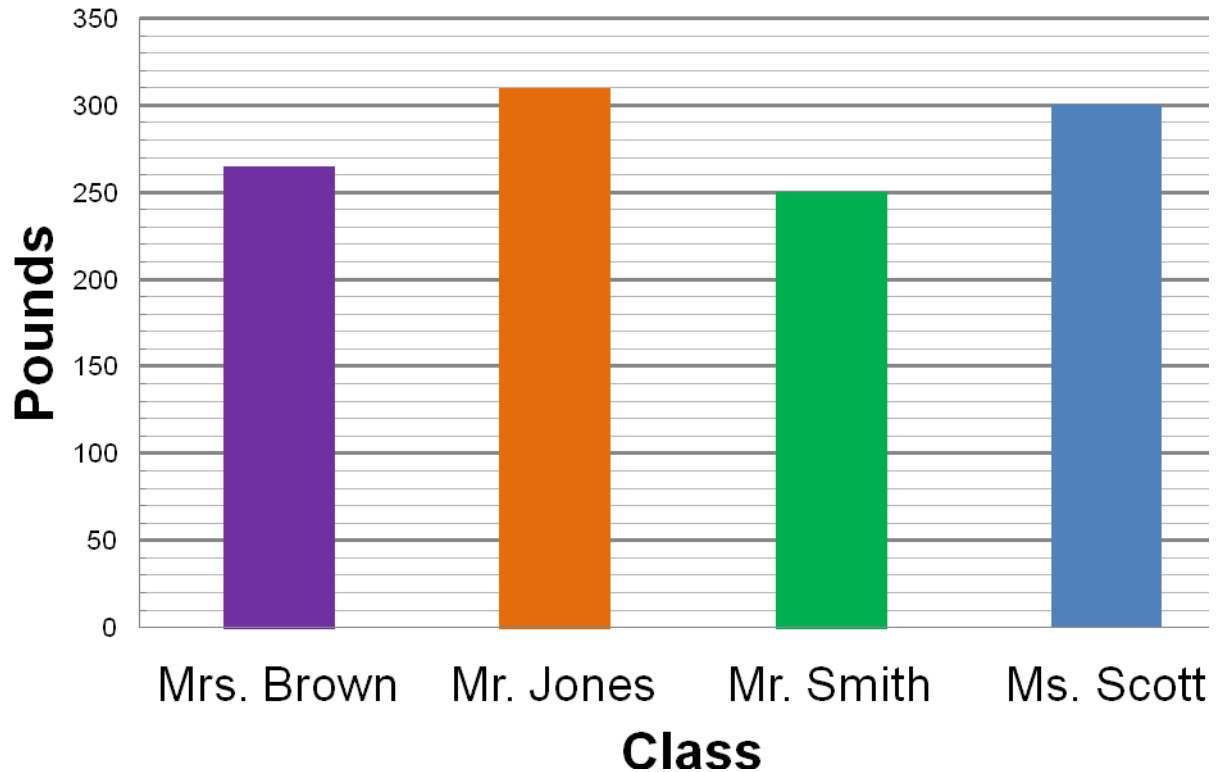
$$2\frac{1}{2}, 3, 3\frac{3}{4}, 3\frac{7}{8}, 5, 5\frac{1}{2}, 9\frac{1}{6}, 10\frac{4}{5}, 15\frac{1}{2}, 20$$

$$20 - 2\frac{1}{2} = 17\frac{1}{2}$$

$$\text{Range} = 17\frac{1}{2}$$

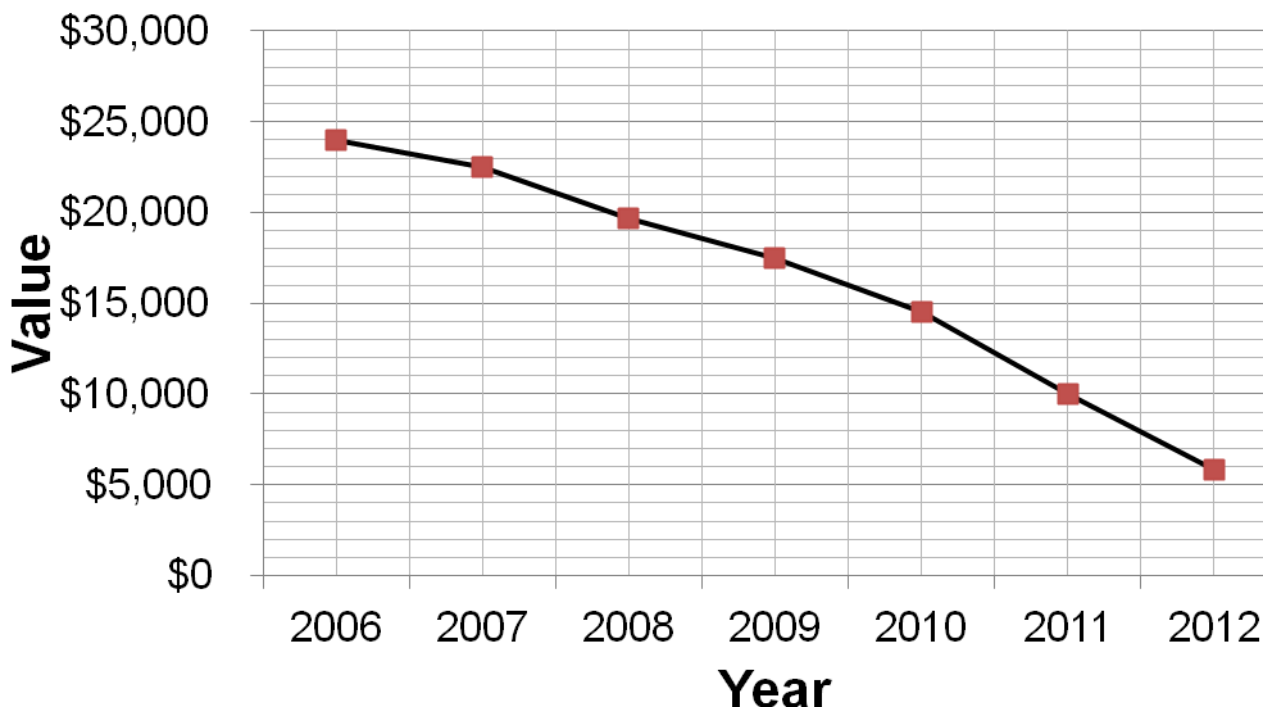
# Bar Graph

**Pounds of Newspapers Recycled by  
Lexington Middle School Students**



# Line Graph

## Value of Sarah's Car



# Stem-and-Leaf Plot

## Math Test Scores

56, 65, 98, 82, 64, 71, 78, 86, 95, 91,  
59, 70, 80, 92, 76, 82, 85, 91, 92, 73

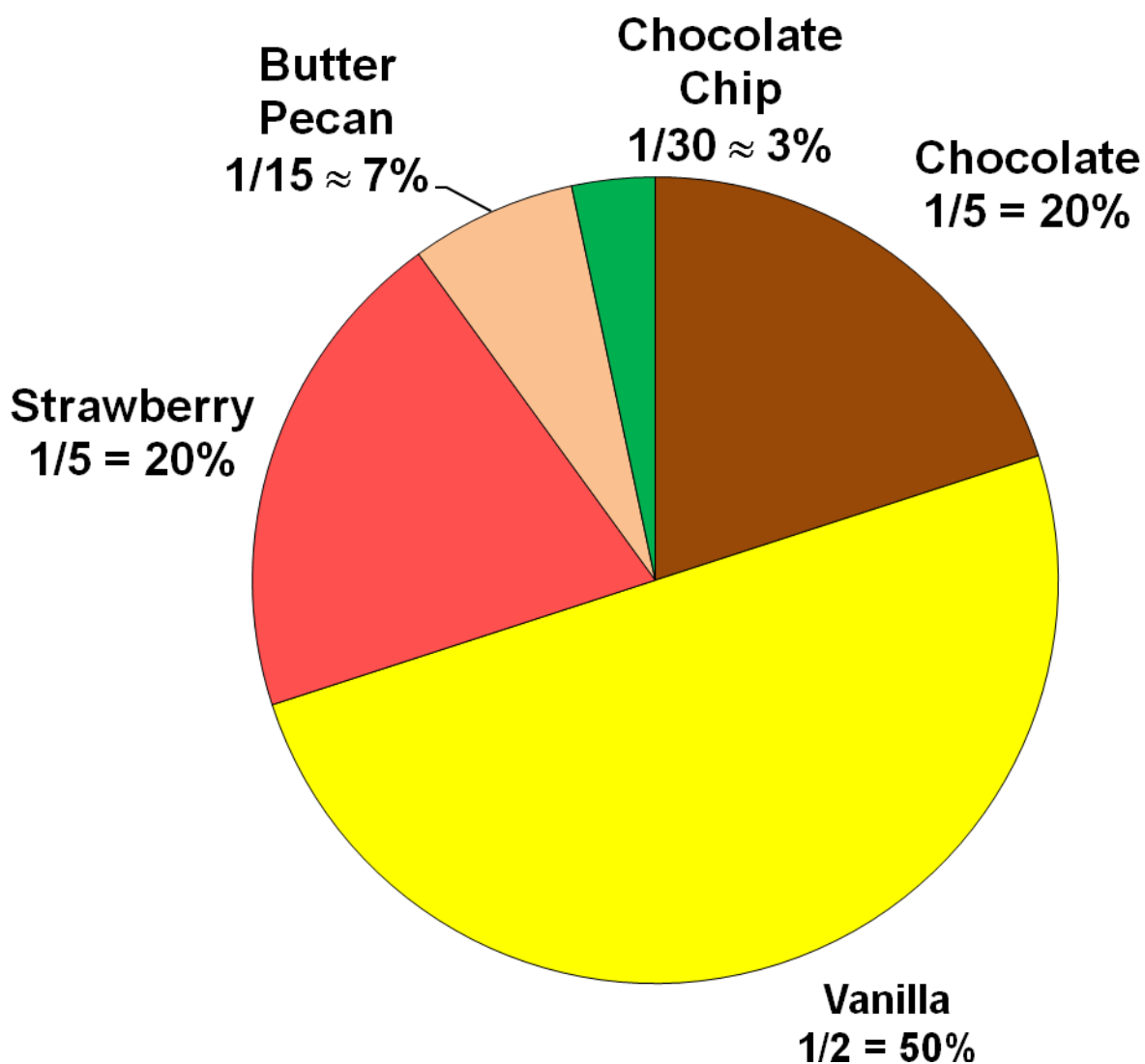
<b>STEM</b>	<b>LEAF</b>
<b>5</b>	<b>6 9</b>
<b>6</b>	<b>4 5</b>
<b>7</b>	<b>0 1 3 6 8</b>
<b>8</b>	<b>0 2 2 5 6</b>
<b>9</b>	<b>1 1 2 2 5 8</b>

Key: 5|6 means 56

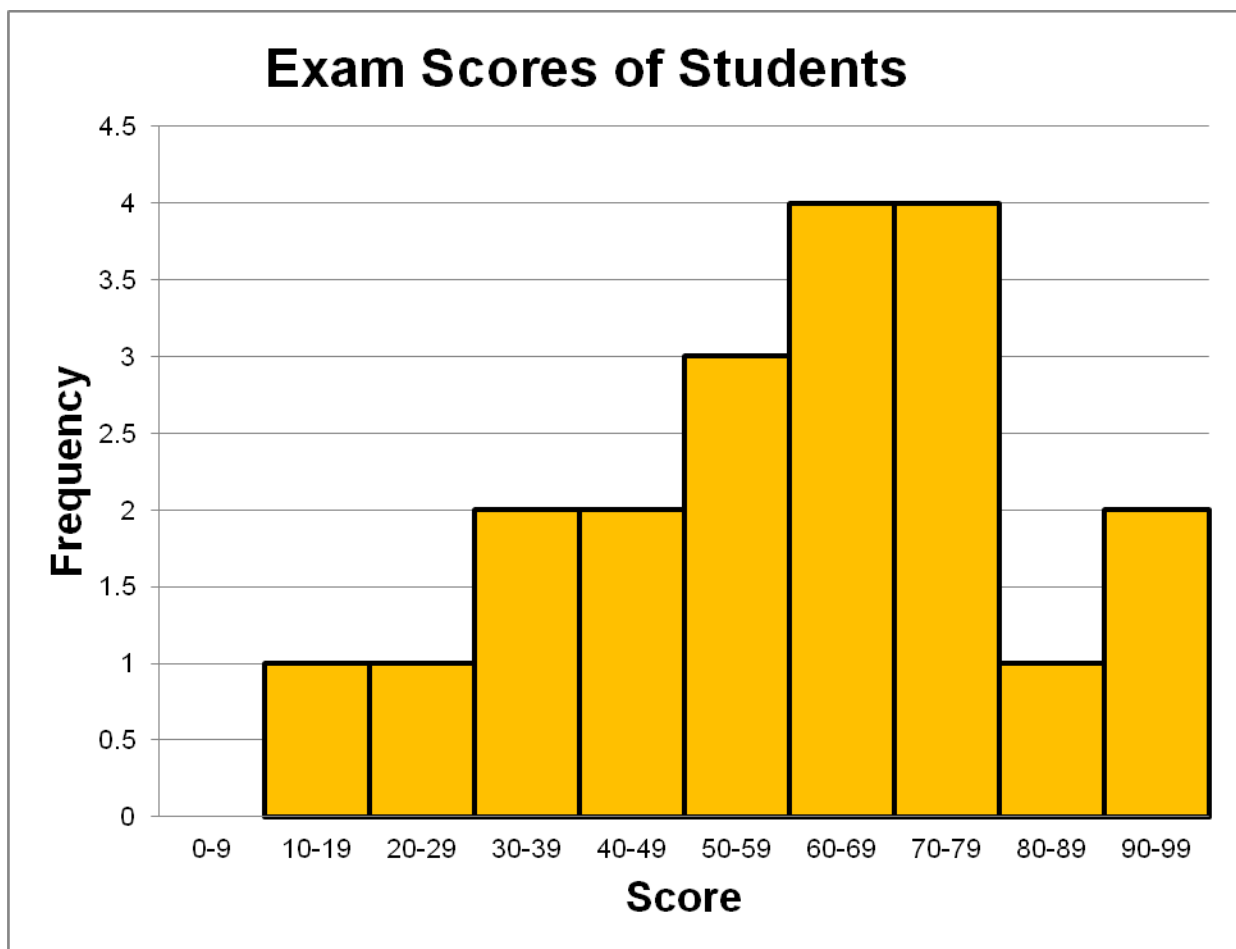


# Circle Graph

## Favorite Ice Cream

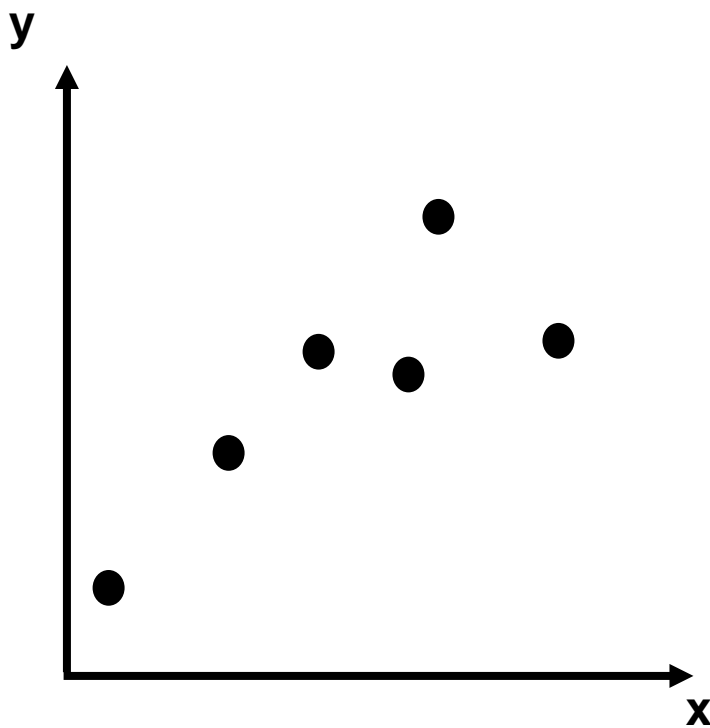


# Histogram



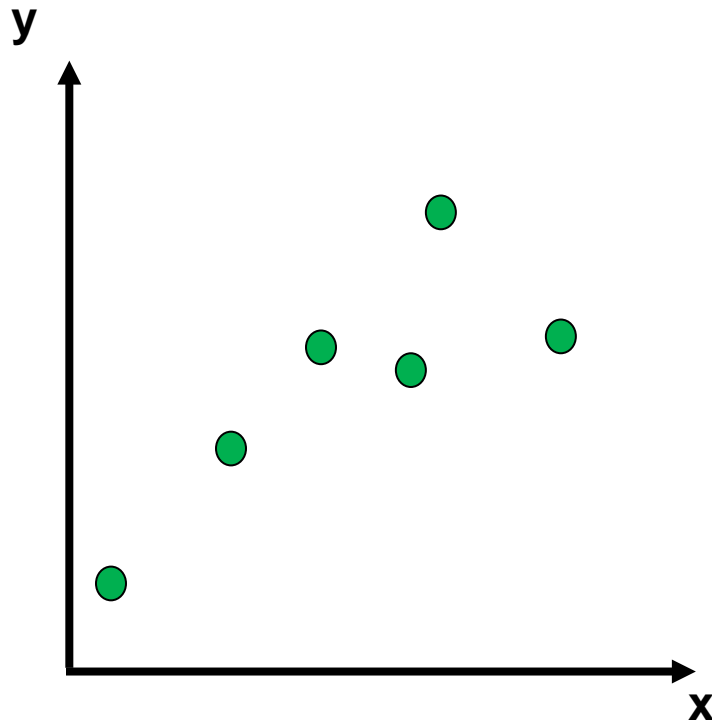
# Scatterplot

illustrates the relationship between two sets of data.



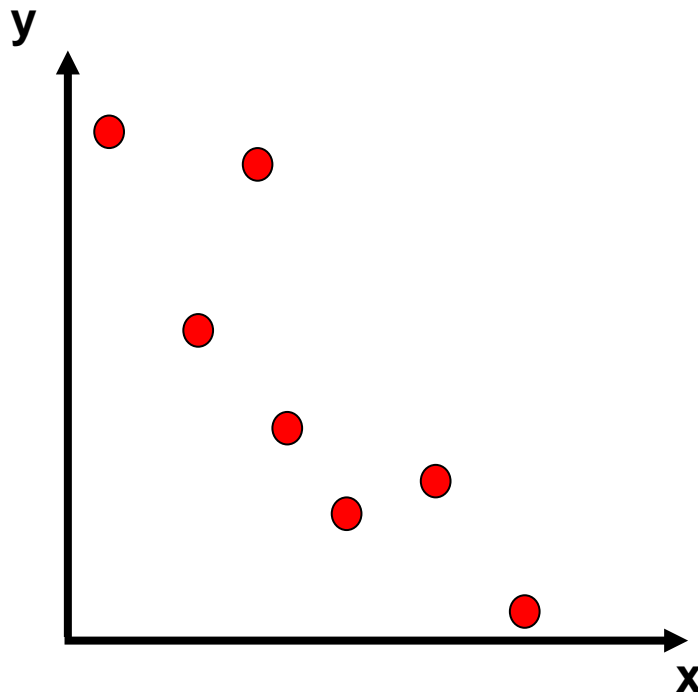
# Positive Correlation

y-coordinates increase as  
x-coordinates increase



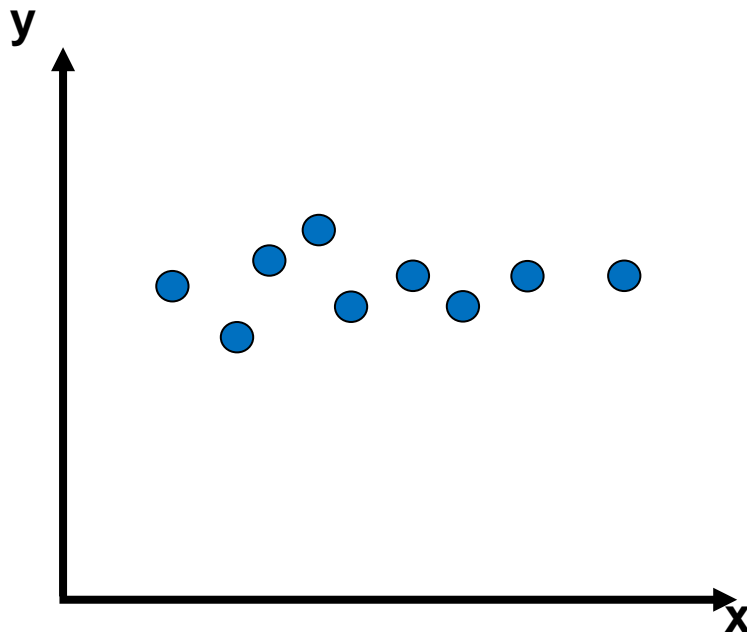
# Negative Correlation

y-coordinates decrease as  
x-coordinates increase



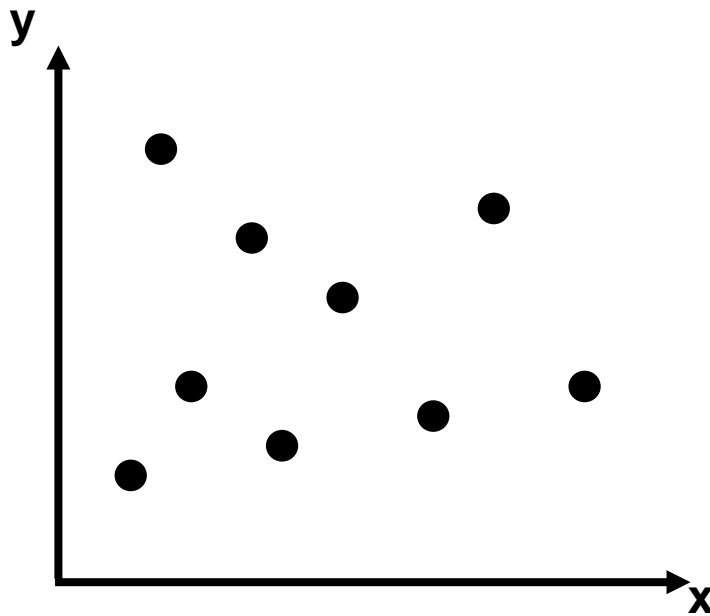
# Constant Correlation

y-coordinates remain about  
the same as x-coordinates  
increase



# No Correlation

no pattern exists between the  $x$ - and  $y$ -coordinates



# Arithmetic Sequences

What is the next term?

$$4, 10, 16, 22 \dots$$

common difference

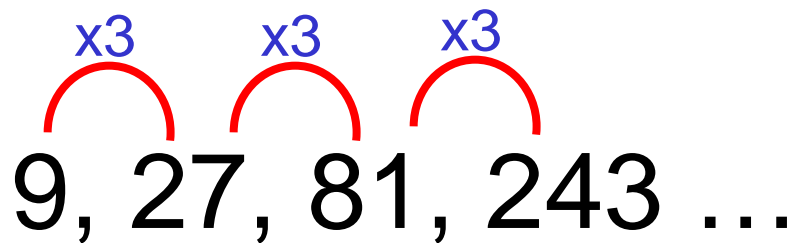
$$3, 3\frac{1}{2}, 4, 4\frac{1}{2}, 5 \dots$$



# Geometric Sequences

What is the next term?

$9, 27, 81, 243 \dots$



A sequence of numbers: 9, 27, 81, 243 followed by an ellipsis. Red arcs connect 9 to 27, 27 to 81, and 81 to 243. Above each arc is the label "x3".

common ratio



A sequence of numbers: 7, 0.7, 0.07, 0.007, 0.0007 followed by an ellipsis. Red arcs connect 7 to 0.7, 0.7 to 0.07, 0.07 to 0.007, and 0.007 to 0.0007. Above each arc is the label "x 1/10".

$7, 0.7, 0.07, 0.007, 0.0007 \dots$

# Additive Identity Property

$$0.3 + 0 = 0.3$$

$$0 + (-7) = -7$$

$$\frac{4}{7} = 0 + \frac{4}{7}$$

$$w + 0 = w$$

# Additive Inverse Property

$$1.4 + (-1.4) = 0$$

$$(-9) + 9 = 0$$

$$0 = \frac{4}{7} + \left(-\frac{4}{7}\right)$$

$$x + (-x) = 0$$

# Associative Property

Addition:

$$(4 + 2) + 8 = 4 + (2 + 8)$$

$$x + \left(3x + \frac{1}{2}\right) = (x + 3x) + \frac{1}{2}$$

Multiplication:

$$(3 \cdot 1.5) \cdot 6 = 3 \cdot (1.5 \cdot 6)$$

$$2(3x) = (2 \cdot 3)x$$

# Commutative Property

Addition:

$$2.76 + 3 = 3 + 2.76$$

$$(a + 5) + 7 = (5 + a) + 7$$

Multiplication:

$$-8 \cdot \frac{2}{3} = \frac{2}{3} \cdot (-8)$$

$$y \cdot 9 = 9y$$

# Multiplicative Identity Property

$$9 \cdot 1 = 9$$

$$1 \cdot (-10) = -10$$

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

# Multiplicative Inverse Property

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

$$1 = \left(-\frac{1}{9}\right) \cdot -9$$

$$x \cdot \frac{1}{x} = 1 \quad (x \neq 0)$$

# Multiplicative Property of Zero

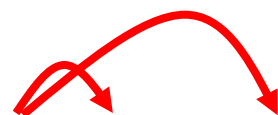
$$0 = 8 \cdot 0$$

$$0(-13) = 0$$

$$\frac{5}{6}x \cdot 0 = 0$$



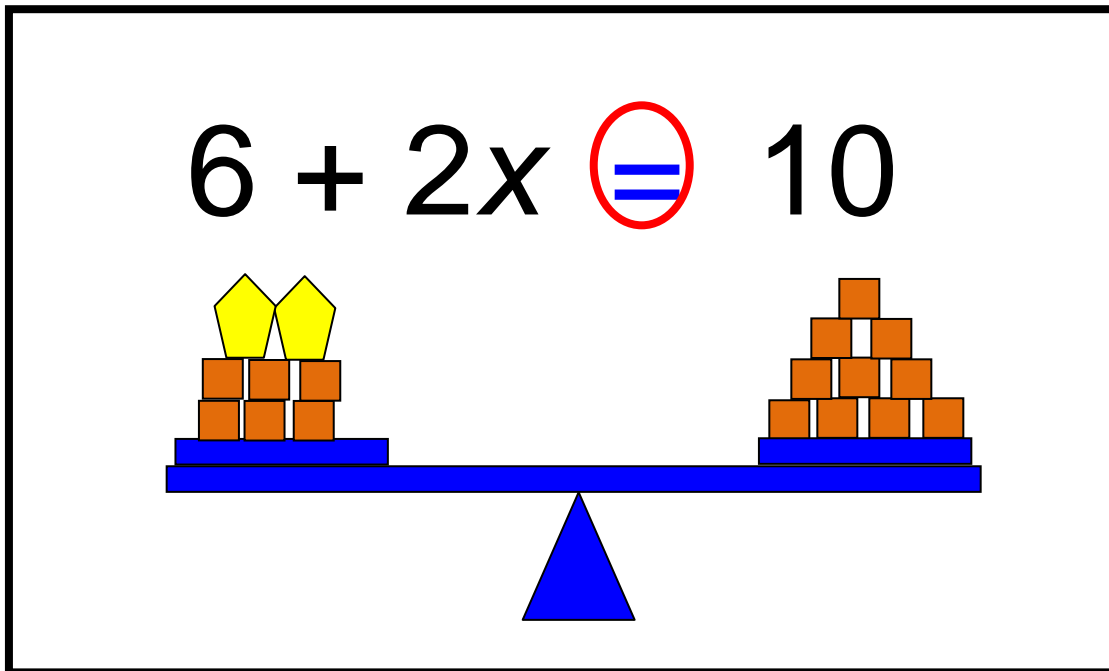
# Distributive Property

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


$$5 \cdot (y - 7) = (5 \cdot y) - (5 \cdot 7)$$

$$(2 \cdot \frac{1}{3}) + (2 \cdot 5) = 2(\frac{1}{3} + 5)$$

# Equation



A mathematical sentence stating that two expressions are equal.

$$2.76 + 3 = 3 + 2.76$$

$$3x = 6.9$$

# Expression

$$x$$

$$-\sqrt{26}$$

$$2x + 3^4$$

$$3(y + 3.9) - \frac{8}{9}$$

# Variable

$$2(y + 3)$$

$$3 + x = 2.08$$

$$A = \pi r^2$$

# Coefficient

$$(-4) + 2x$$

$$-7y^2$$

$$\frac{2}{3}ab - \frac{1}{2}$$

# Term

$$\underbrace{3x} + \underbrace{2y} - \underbrace{8}$$

3 terms

$$\underbrace{-5x^2} + \underbrace{(-2x)}$$

2 terms

$$\underbrace{\frac{2}{3}ab}$$

1 term

# Constant

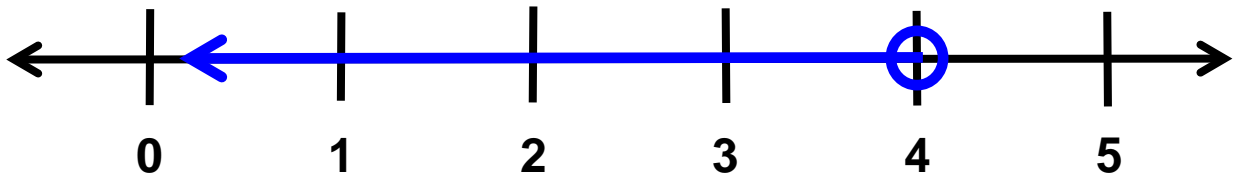
$$4x - 12$$

$$7 - 2y + x - 6x^2$$

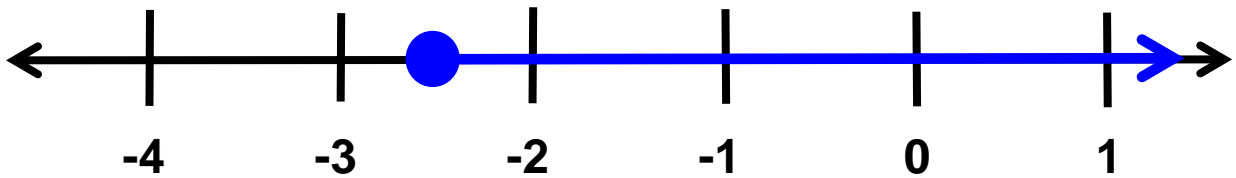
$$3(x + 3.9) - \frac{8}{9}$$

# Inequality

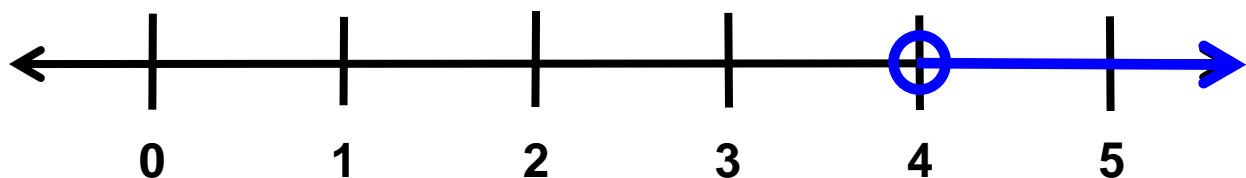
$$y < 4$$



$$3r \geq -7.5$$



$$-3(n - 4) < 0$$





# Like Terms

$$\textcircled{4x} - 3y + \textcircled{6x} - 7$$

$$\textcircled{2y^2} - 3y + \textcircled{7y^2}$$

$$-5r^2 \textcircled{-6} + 2r + \textcircled{2}$$

# Relations

$\{(2,3), (4,1), (2,5)\}$

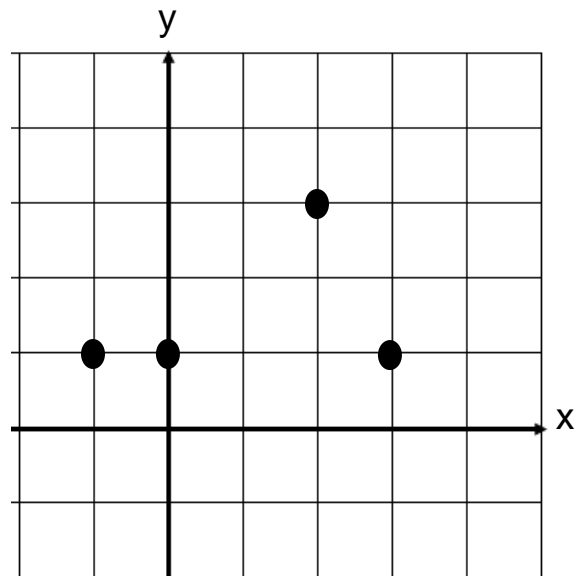
$x$	$y$
2	2
-3	4
5	-1
0	4
1	-6

$\{(0,4), (0,3), (0,2), (0,1)\}$

# Functions

$\{(2,4), (3,2), (0,2), (-1,2)\}$

$x$	$y$
3	2
2	4
0	2
-1	2



# Table of Values

$x$	$y$
0	1
1	2
2	5
3	10
4	17

$a$	1	2	3	4
$b$	22,500	22,000	21,500	21,000

# Domain

$\{(-2,0), (-1,1), (0,2), (1,3)\}$

$x$	$y$
-2	0
-1	1
0	2
1	3

$\{-2, -1, 0, 1\}$

# Range

$\{(-2,0), (-1,1), (0,2), (1,3)\}$

$x$	$y$
-2	0
-1	1
0	2
1	3

$\{0, 1, 2, 3\}$

# Dependent/ Independent Variable

Determine the **distance** a car will travel going 55 mph.

$$d = 55h$$

independent

$h$	$d$
0	0
1	55
2	110
3	165

dependent

# Independent Variable

$$y = 2x + 7$$

$x$  represents the independent variable (input values or domain)



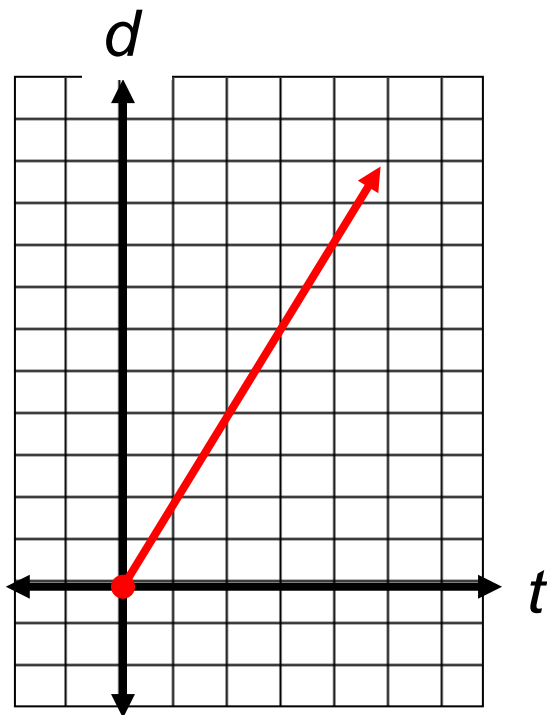
# Dependent Variable

$$y = 2x + 7$$

$y$  represents the  
dependent variable  
(output values or range)

# Connecting Representations

The total distance Sam walks depends on how long he walks. If he walks at 2.1 mph, show multiple representations of the relationship.



$t$	$d$
0	0
1	2.1
2	4.2
4	8.4

$$d = 2.1t$$

# Multistep Equations

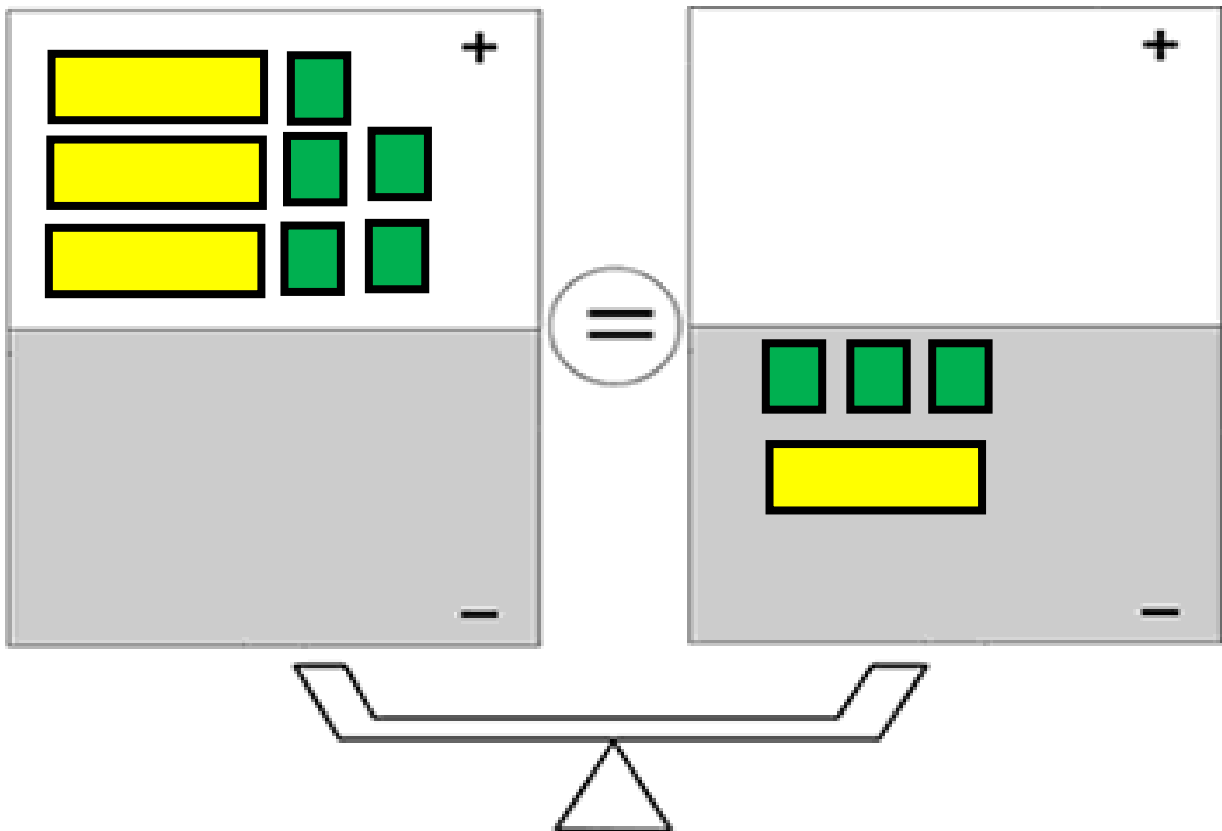
$$2x - 5.7 = -3.4x + 11.04$$

$$\frac{2}{3}(n + 9) = -\frac{5}{6}n$$

$$25 = \frac{6p - 5}{-4}$$

# Multistep Equation

$$3x + 5 = -3 - x$$



# Unit Rate as Slope

A student walks 2 miles per hour

$$\frac{2 \text{ miles}}{1 \text{ hour}}$$

