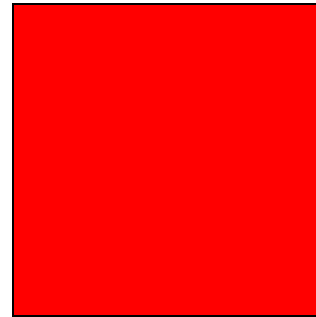


square root

$$16 = 4^2 = 4 \times 4$$
$$\text{square root} = 4$$

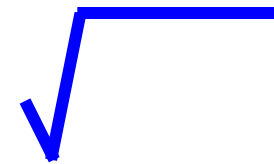


15

square root =
15

15

radical



$$\sqrt{16} = \sqrt{4^2} = \sqrt{4 \times 4}$$

$$\sqrt{16} = 4$$

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

$$\sqrt{36} = 6$$

-6

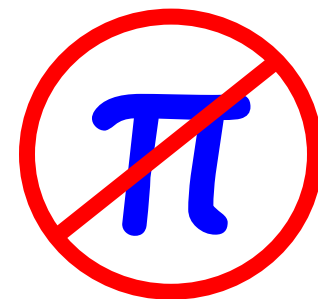
rational

$\frac{2}{9}$

2.125

$\frac{1}{3}$

0.007



1235439.2581

irrational

$\sqrt{2}$


$\sqrt{3}$


Golden Ratio
1.61803...

π

exponent

$$2^3$$


$$4^7$$


$$10^2$$


additive inverse

$$7 \rightarrow -7$$
$$7 + -7 = 0$$

$$-3 \rightarrow 3$$
$$-3 + 3 = 0$$

multiplicative inverse

$$2 \rightarrow \frac{1}{2}$$

$$\frac{1}{4} \rightarrow 4$$

$$\frac{3}{5} \rightarrow \frac{5}{3}$$

$$x \rightarrow \frac{1}{x}$$

$$0.126936 = 1.26936 \cdot 10^{-2}$$

scientific notation

$$693618 = 6.93618 \cdot 10^5$$

$$6936 = 6.936 \cdot 10^3$$

significant digits

Number	Significant Digits
23.61	4
2.361	4
2.3610	5
236,100	4
236,100.	6
$2.3610 \cdot 10^5$	5

3 < 5 inequality $x \geq 1$

6 > -12 <, ≤, >, ≥ $a + 2 \leq -5$

sequence

3, 5, 7, 9, 11, ...

10, 9, 8, 7, 6, -5, ...

0, -5, -10, -15, -20, ...

arithmetic sequence

3, 7, 11, 15, 19

-2, -7, -12, -17, -22

12, 7, 2, -3, -8, -13, -18

recursive

Fibonacci Sequence

(1, 1, 2, 3, 5, 8, ...)

$$F_n = F_{n-1} + F_{n-2}$$

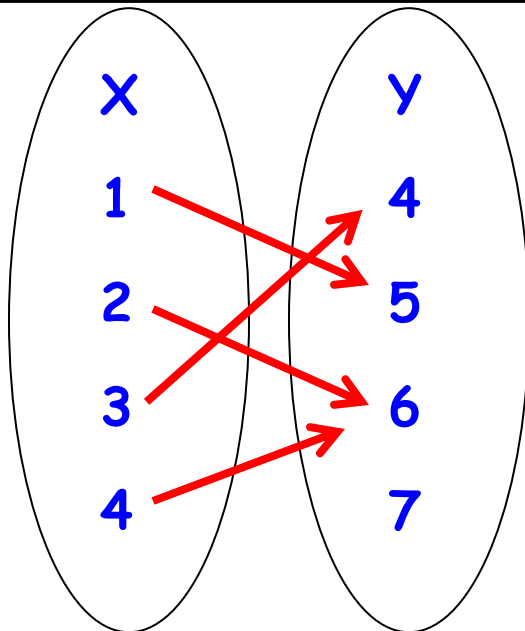
$$F_1 = F_2 = 1$$

Factorial

$$n! = n(n-1)!$$

$$= n(n-1)(n-2)\dots 1$$

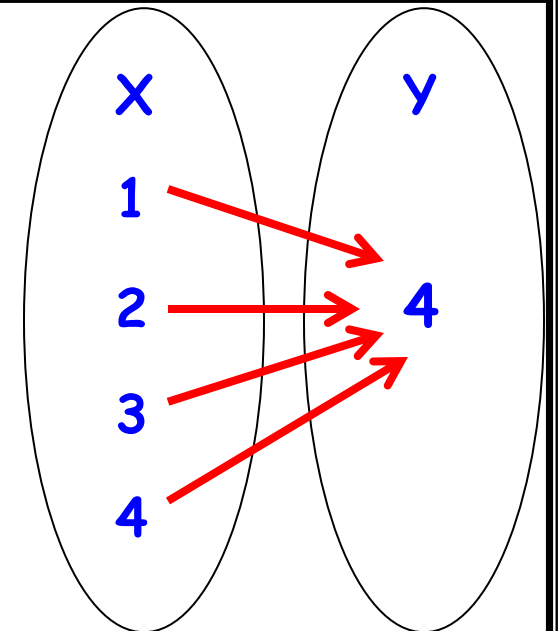
$$4! = 4(3)(2)(1)$$



function

$$y = 2x$$

$$y = 6x - 3$$



linear function

$$y = 4x + 8$$

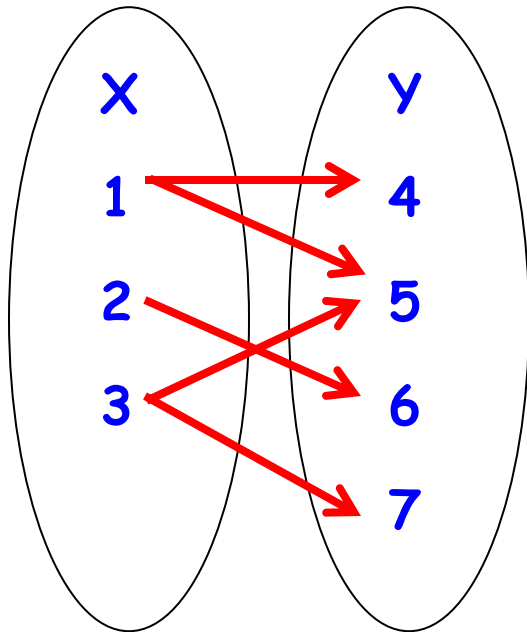
$$y = 3x$$

$$y = 6x - 3$$

$$y = 6x - 3$$

$$y = -4x$$

$$y = -2x - 6$$



relation

$\{(2, -6), (1, 4), (2, 4), (0, 0), (1, -6), (3, 0)\}$


X	Y
3	4
7	2
0	-1
-2	2
5	0
3	3

rate of change

$$\frac{3 \text{ ft}}{1 \text{ sec}} \quad 3 \text{ ft/sec}$$

	Time (sec)	Distance (ft)	
1 sec	1	3	3 ft
1 sec	2	6	3 ft
1 sec	3	9	3 ft
1 sec	4	12	3 ft
1 sec	5	15	3 ft

difference in y's
difference in x's

$$y = 3x + 4$$


slope

rise
run

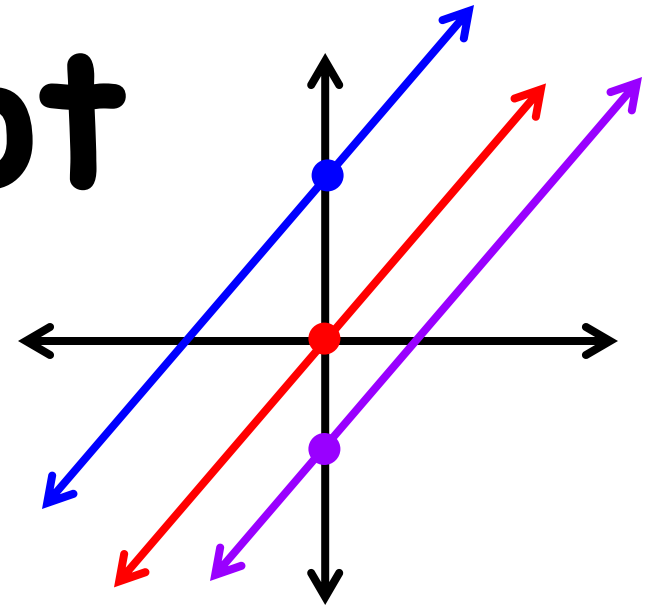


intercept

$$y = 3x + 4$$



y-intercept



linear equality

$$y = 2x + 3$$

$$y = \frac{1}{2}x - 5$$

$$y = 3$$

$$y = 4x + 10$$

$$y = \frac{3}{4}b$$

linear inequality

$$y < 5x$$

$$y \geq 3x - 5$$

$$y \leq 4x + 10$$

$$y > 2x + 4$$

like terms

$2x$ and x

x^2 and $3x^2$

$3y$ and $6y$

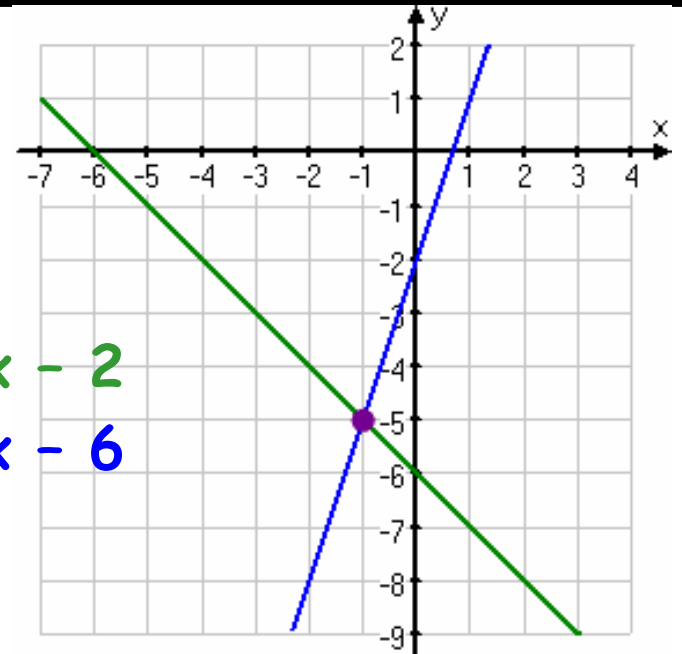
~~$2b$ and x~~

~~x and $3x^2$~~

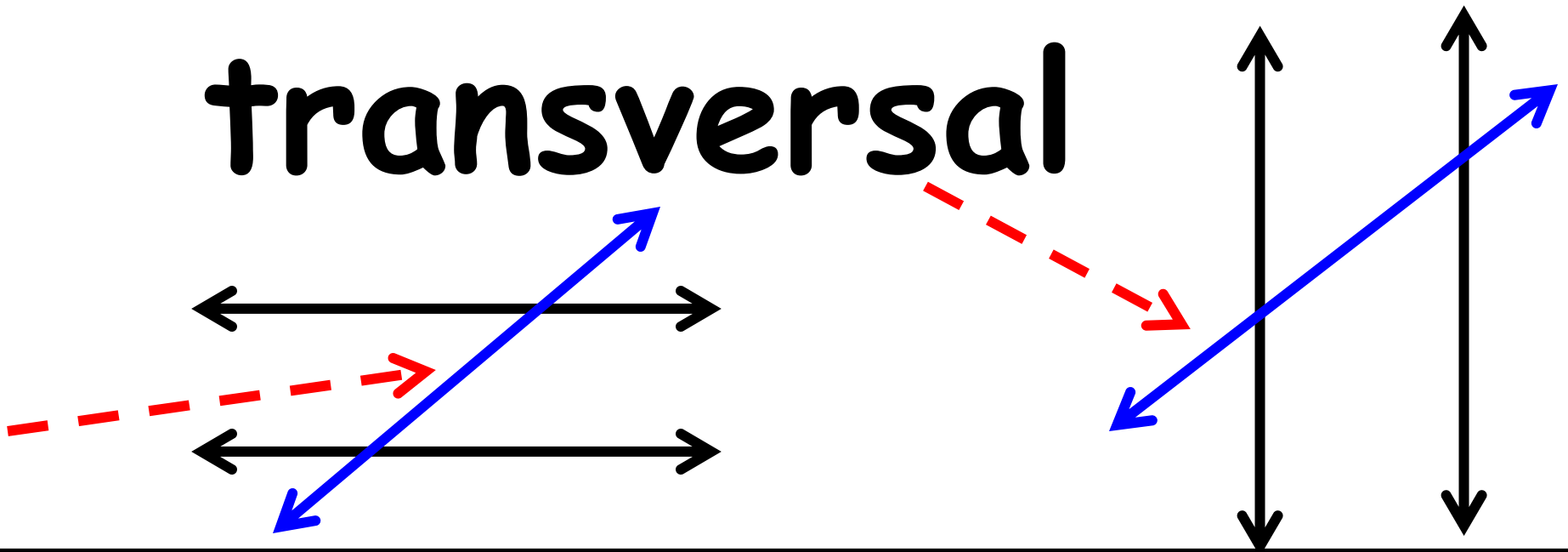
~~4 and $2y$~~

system of linear equations

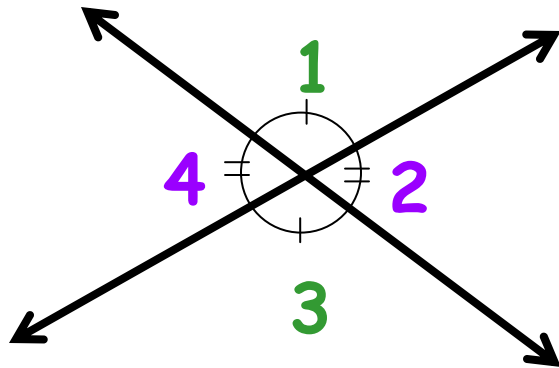
$$y = 3x - 2$$
$$y = -x - 6$$



transversal



vertical angles



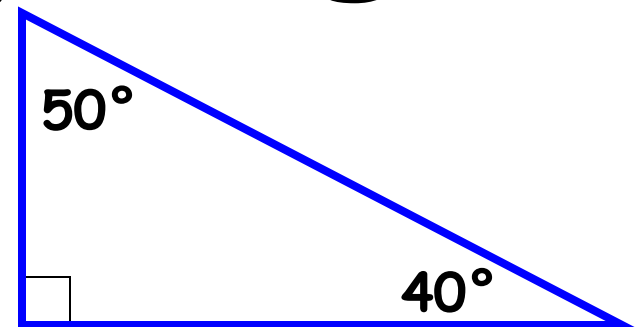
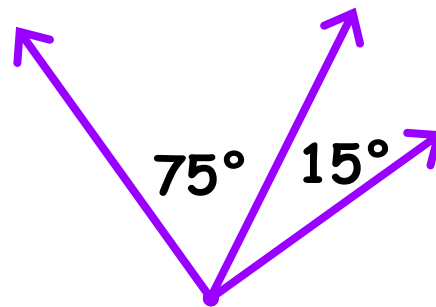
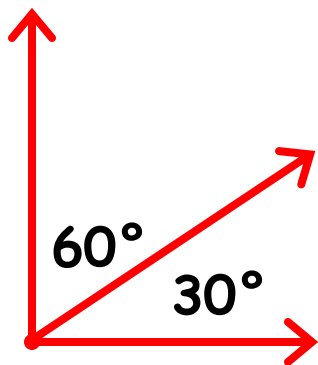
Angles 1 and 3

$$m\angle 1 = m\angle 3$$

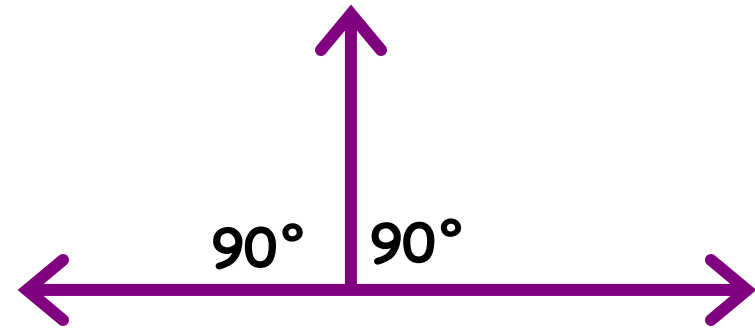
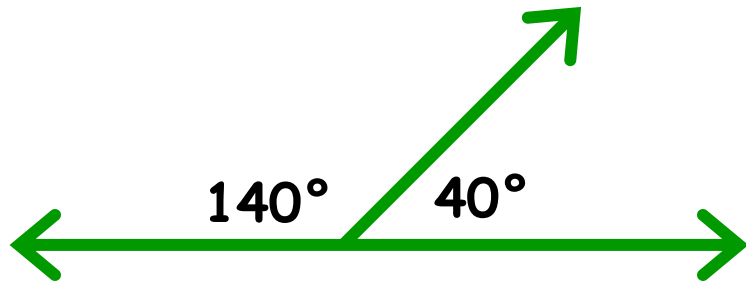
Angles 2 and 4

$$m\angle 2 = m\angle 4$$

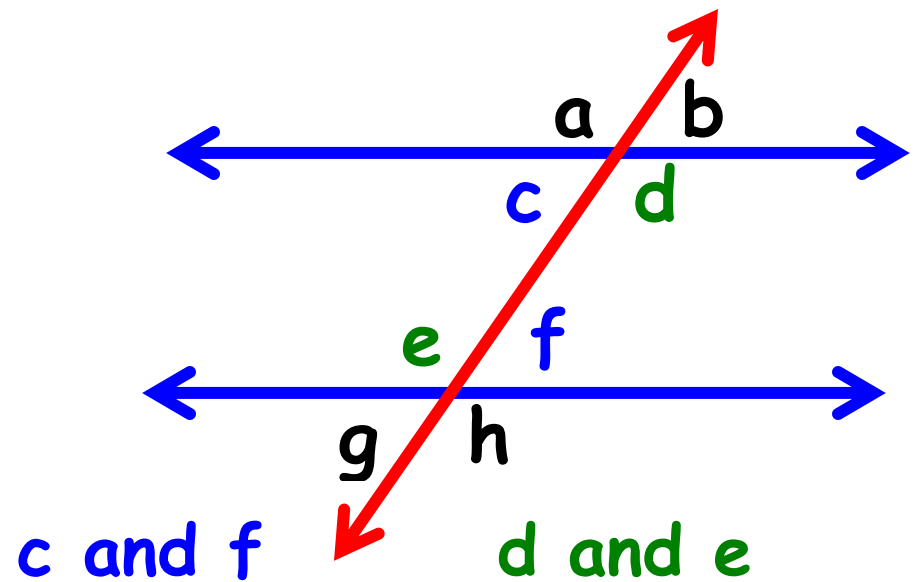
complementary angles



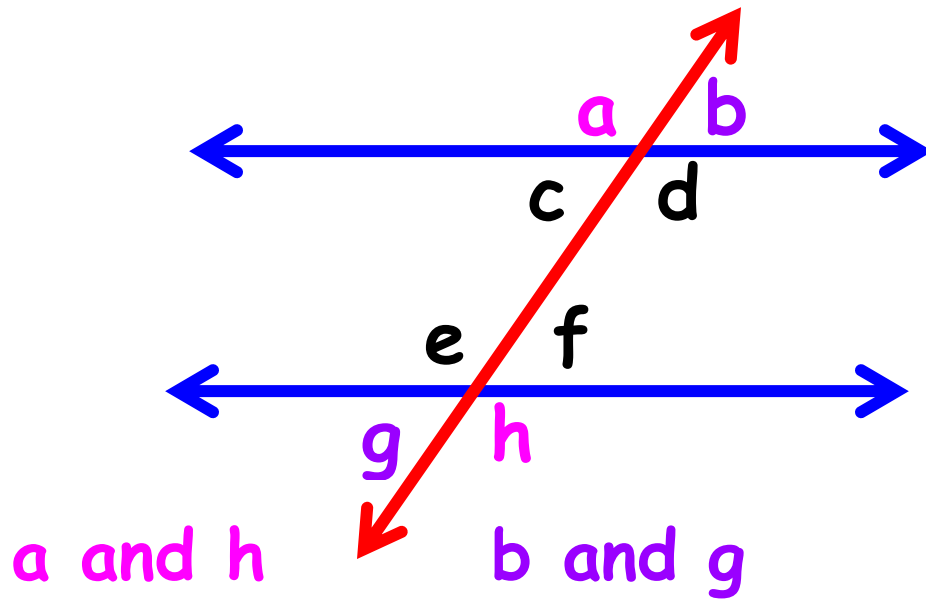
supplementary angles



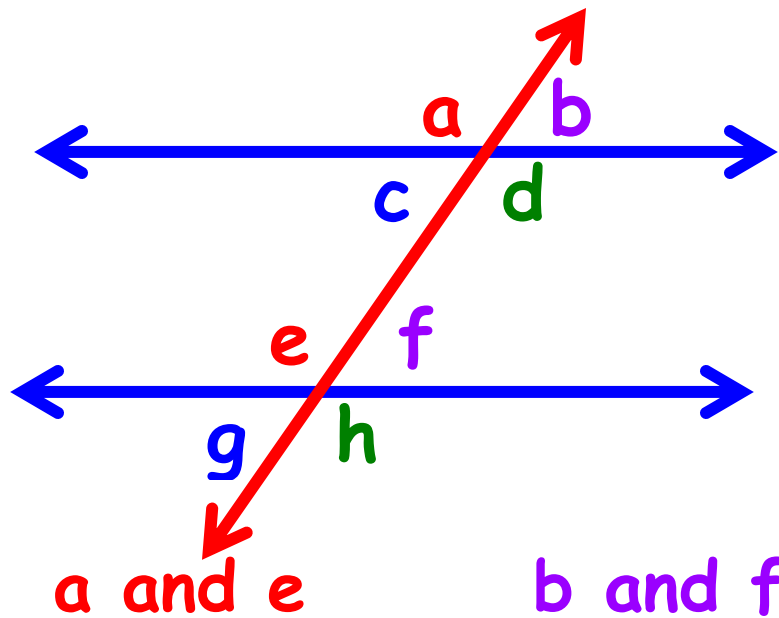
alternate interior angles



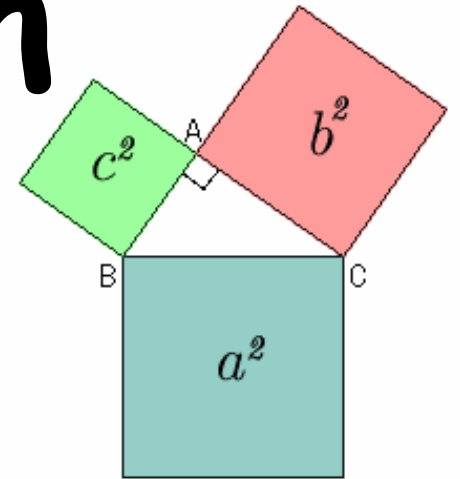
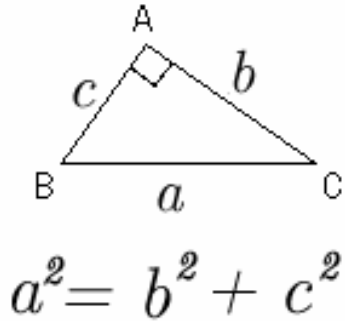
alternate exterior angles



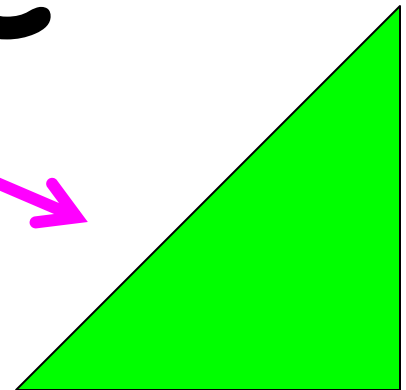
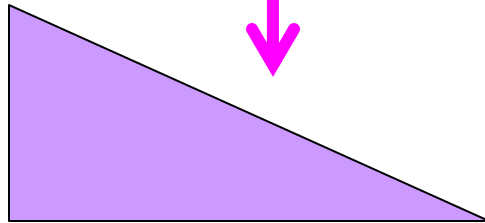
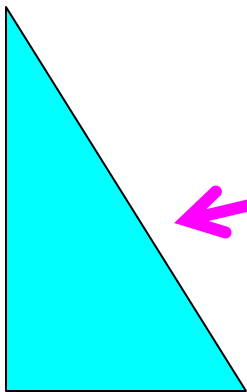
corresponding angles



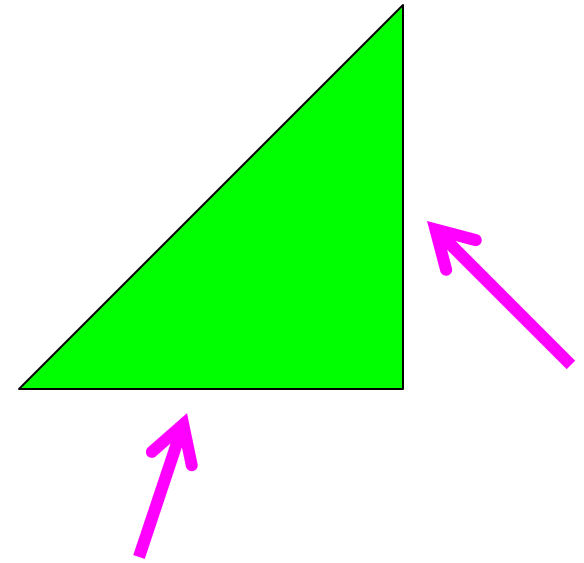
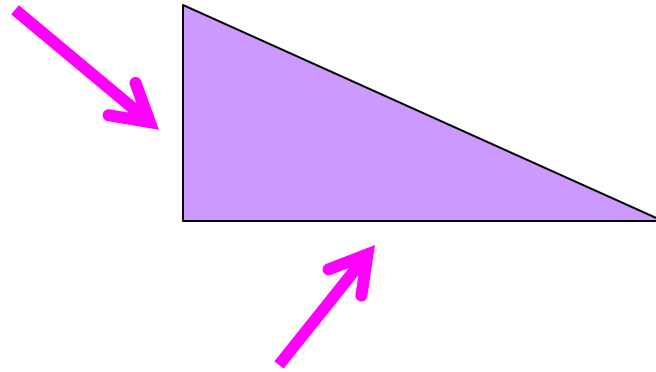
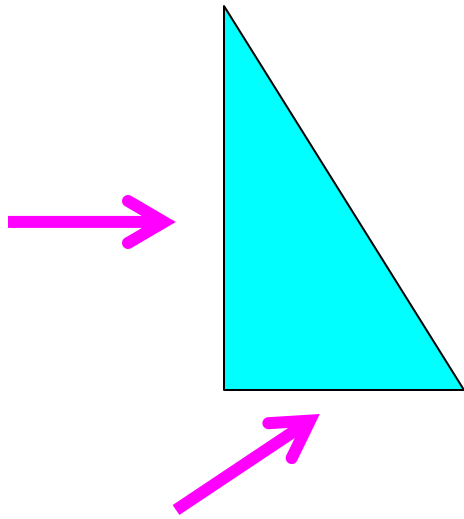
Pythagorean Theorem



hypotenuse



legs



set { }

$B = \{2, 4, 6, 8, 10\}$

$X = \{a, b, c, d, e\}$

$Z = \{\text{dog, cat, fish, turtle}\}$

element \in

$$B = \{2, 4, 6, 8, 10, \dots, 50\}$$

$$4 \in B$$

$$Z = \{\text{dog, cat, fish, turtle}\}$$

$$X = \{a, b, c, d, e\}$$

$$b \in X$$

$$\text{dog} \in Z$$

subset \subset

$$A = \{4, 6, 12, 48\}$$

$$B = \{2, 4, 6, 8, 10, \dots, 50\}$$

$$C = \{-3, -1, 5, 11, 12\}$$

$$D = \{\text{all integers} < 100\}$$

$$A \subset B$$

$$A \subset D$$

$$B \subset D$$

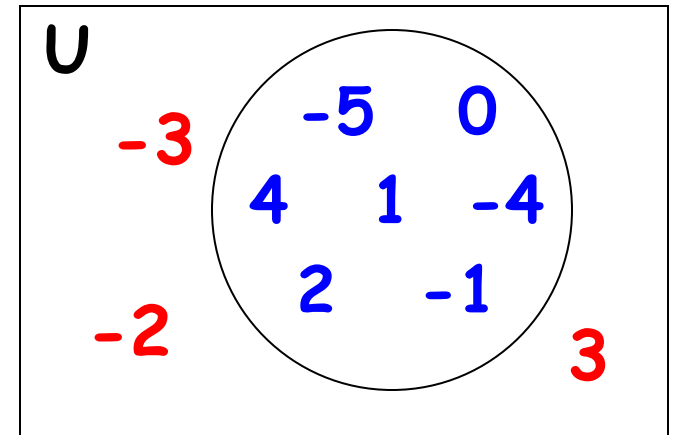
$$C \subset D$$

complement of a set

$$U = \{\text{all integers } x: -5 \leq x \leq 5\}$$

$$A = \{-5, -4, -1, 0, 1, 2, 4\}$$

$$A' = \{-3, -2, 3\}$$



intersection \cap

$$A = \{4, 6, 12, 48\}$$

$$B = \{2, 4, 6, 8, 10, \dots, 50\}$$

$$C = \{-3, -1, 5, 6, 11, 12\}$$

$$D = \{\text{all integers } < 100\}$$

$$A \cap B = \{4, 6, 12\}$$

$$A \cap C = \{6, 12\}$$

$$B \cap C = \{6, 12\}$$

$$A = \{4, 6, 12, 48\}$$

$$B = \{2, 4, 6, 8, 10, \dots 50\}$$

$$C = \{-3, -1, 5, 11, 12\}$$

$$D = \{\text{all integers} < 100\}$$

union \cup

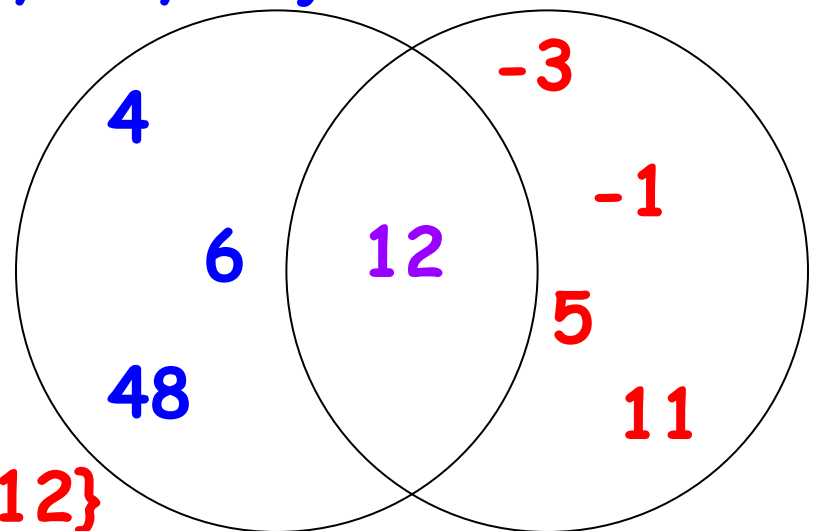
$$A \cup B = \{2, 4, 6, 8, 10, \dots 50\}$$

$$A \cup C = \{-3, -1, 4, 5, 6, 11, 12, 48\}$$

Venn diagram

$$A = \{4, 6, 12, 48\}$$

$$C = \{-3, -1, 5, 11, 12\}$$

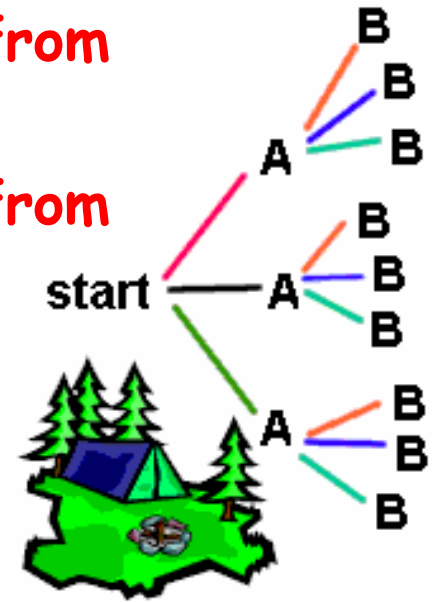


tree diagram

There are 3 trails from start to Camp A.

There are 3 trails from Camp A to Camp B.

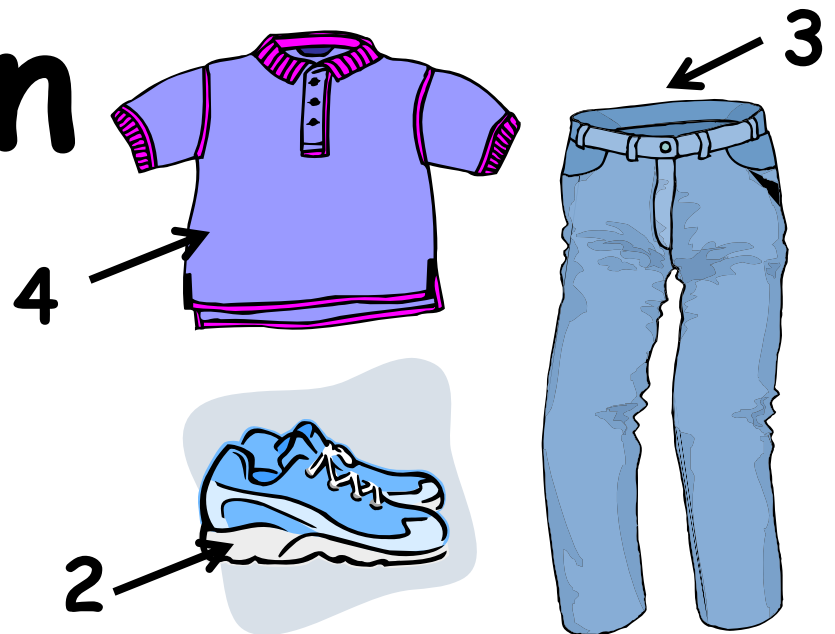
How many routes?



multiplication principle

How many outfits?

$$4 \times 3 \times 2 = 24$$



addition principle

$$\begin{aligned} P(\text{even or } 3) &= P(2) + P(3) \\ &= \frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6} = \frac{4}{6} = \frac{2}{3} \end{aligned}$$



line of
best fit

