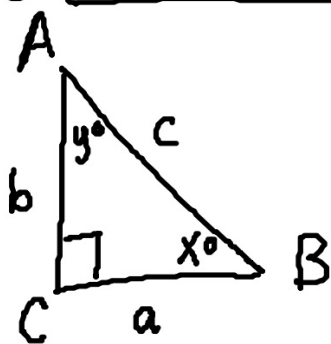


① Right triangle



$x^\circ + y^\circ = 90^\circ$
(complementary angles)

$a^2 + b^2 = c^2$
(Pythagorean Thm.)

* $a, b \Rightarrow$ legs; $c \Rightarrow$ hypotenuse

② Trig. Functions

Soh Cah Toa
i n o s a n

* $o \Rightarrow$ opposite

* $a \Rightarrow$ adjacent

* $h \Rightarrow$ hypotenuse

* $\theta \Rightarrow$ "theta" reference angle



$$\sin \theta = \frac{\text{opp}}{\text{hyp}} \implies \theta = \sin^{-1}\left(\frac{\text{opp}}{\text{hyp}}\right)$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} \implies \theta = \cos^{-1}\left(\frac{\text{adj}}{\text{hyp}}\right)$$

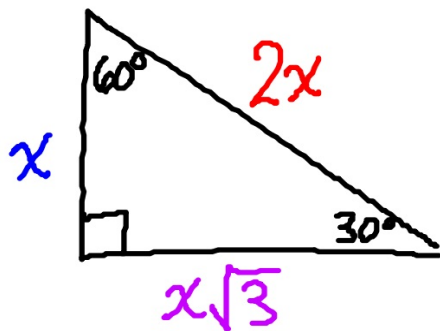
$$\tan \theta = \frac{\text{opp}}{\text{adj}} \implies \theta = \tan^{-1}\left(\frac{\text{opp}}{\text{adj}}\right)$$

Use when finding
an unknown
side length

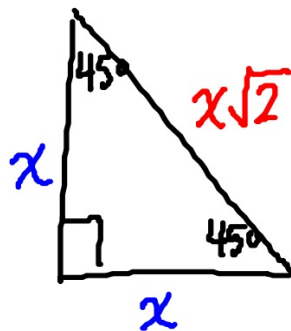
Use when solving
for unknown angle

③ Special Right triangles

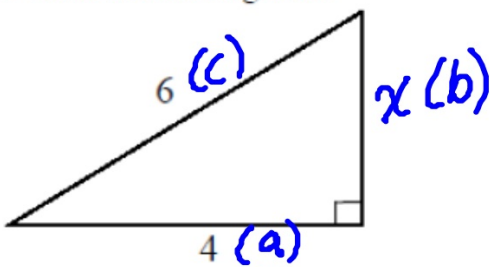
$30^\circ - 60^\circ - 90^\circ$



$45^\circ - 45^\circ - 90^\circ$



8. Find the missing side.



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

$$(4)^2 + (x)^2 = (6)^2$$

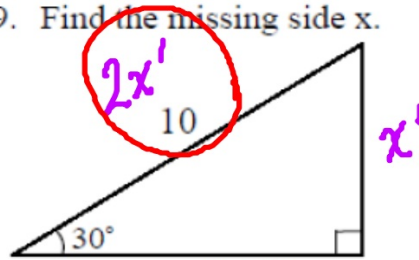
$$16 + x^2 = 36$$

$$\begin{array}{r} 16 \\ -16 \\ \hline \end{array}$$

$$\sqrt{x^2} = \sqrt{20}$$

$$x = \sqrt{20} = 2\sqrt{5} \approx 4.47$$

9. Find the missing side x.



$$\begin{array}{l} \text{opp} = \text{---} \\ \text{adj} = \frac{x}{10} \\ \text{hyp} = 10 \\ \theta = 30^\circ \end{array}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\cos(30) = \frac{x}{10} * 10$$

$$x \approx 8.66$$

$$2x' = 10$$

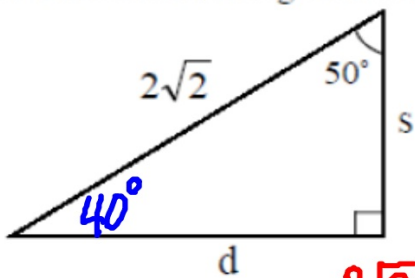
$$x' = 5$$

$$x = x' \sqrt{3}$$

$$x = 5\sqrt{3}$$

$$x \approx 8.66$$

10. Find both missing sides and the missing angle.



Solve for d

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$2\sqrt{2} * \sin(50) = \frac{d}{2\sqrt{2}} * 2\sqrt{2}$$

$$d \approx 2.17$$

$$\text{opp} = \underline{d}$$

$$\text{adj} = \underline{s}$$

$$\text{hyp} = \underline{2\sqrt{2}}$$

$$\theta = \underline{50^\circ}$$


Solve for s

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\cos(50) = \frac{s}{2\sqrt{2}} * 2\sqrt{2}$$

$$s \approx 1.82$$

Scientific Notation

$$\textcircled{a} \times 10^{\textcircled{n}} \Rightarrow \text{integer} \\ (\dots -2, -1, 1, 2, 3).$$


a number greater
than 1 but less
than 10

Scientific Notation

$$2.45 \underbrace{00000000.}$$

11. What does 2.45×10^9 mean? Expand it.

12. Fill in the blanks to make the equation equal.

a. 3.1 $\times 10^4 = \underbrace{31,000.}$

b. .000205 $\times 10^6 = 205$

c. $64.2 \times 10^7 = \underbrace{642,0000,00.}$

d. .015,000. $\times 10^{-6} = \underline{.015}$

e. $7.14 \times \underline{10^6} = \underbrace{7,140,000.}$

f. .008,450. $\times \underline{10^{-6}} = .00845$
6 5 4 3 2 1

$$\underbrace{.000205.}$$

$$\frac{1.6 \text{ m}}{1000 \text{ m}} = \frac{1 \text{ km}}{1000 \text{ m}}$$

$$\begin{aligned} 1000 \text{ mm} &= 1 \text{ m} \\ 100 \text{ cm} &= 1 \text{ m} \\ 12 \text{ in} &= 1 \text{ ft} \\ 2.54 \text{ cm} &= 1 \text{ in} \end{aligned}$$

$$1000 \text{ m} = 1 \text{ km}$$

$$\frac{160 \text{ cm}}{100 \text{ cm}} = \frac{1 \text{ m}}{100 \text{ cm}}$$

$$\begin{aligned} 24 \text{ h} &= 1 \text{ day} \\ 60 \text{ min} &= 1 \text{ h} \\ 60 \text{ s} &= 1 \text{ min} \end{aligned}$$

$$\frac{160 \text{ cm}}{100 \text{ cm}} = \frac{1 \text{ m}}{100 \text{ cm}}$$
$$\frac{1000 \text{ mm}}{1 \text{ m}} = \frac{1000 \text{ mm}}{1 \text{ m}}$$

Unit conversion

13. Convert 160 centimeters to

- a. meters
- b. millimeters
- c. kilometers
- d. inches
- e. feet

~~1 km~~

~~1000 m~~

16 km

$$\frac{160 \text{ cm}}{100 \text{ cm}} \times 1 \text{ m} = 1.6 \text{ m}$$

$$\frac{160 \text{ cm}}{100 \text{ cm}} \times 1 \text{ m} \times \frac{1000 \text{ mm}}{1 \text{ m}} = 1600 \text{ mm}$$

4. How many _____ are in one year? Write your answer in scientific notation.

- a. days
- b. hours
- c. minutes
- d. seconds

$$\frac{160 \text{ cm}}{2.54 \text{ cm}} \times 1 \text{ in} = 62.9921 \approx 63 \text{ in}$$

$$\frac{63 \text{ in}}{12 \text{ in}} \times 1 \text{ ft} = 5.2493 \approx 5.2 \text{ ft}$$

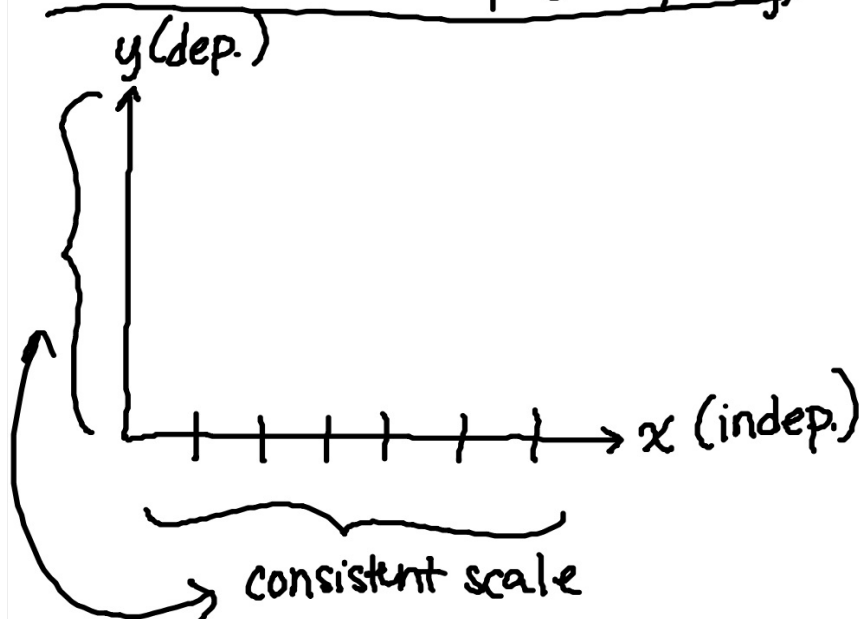
(a) $365 = 3.65 \times 10^2$ days

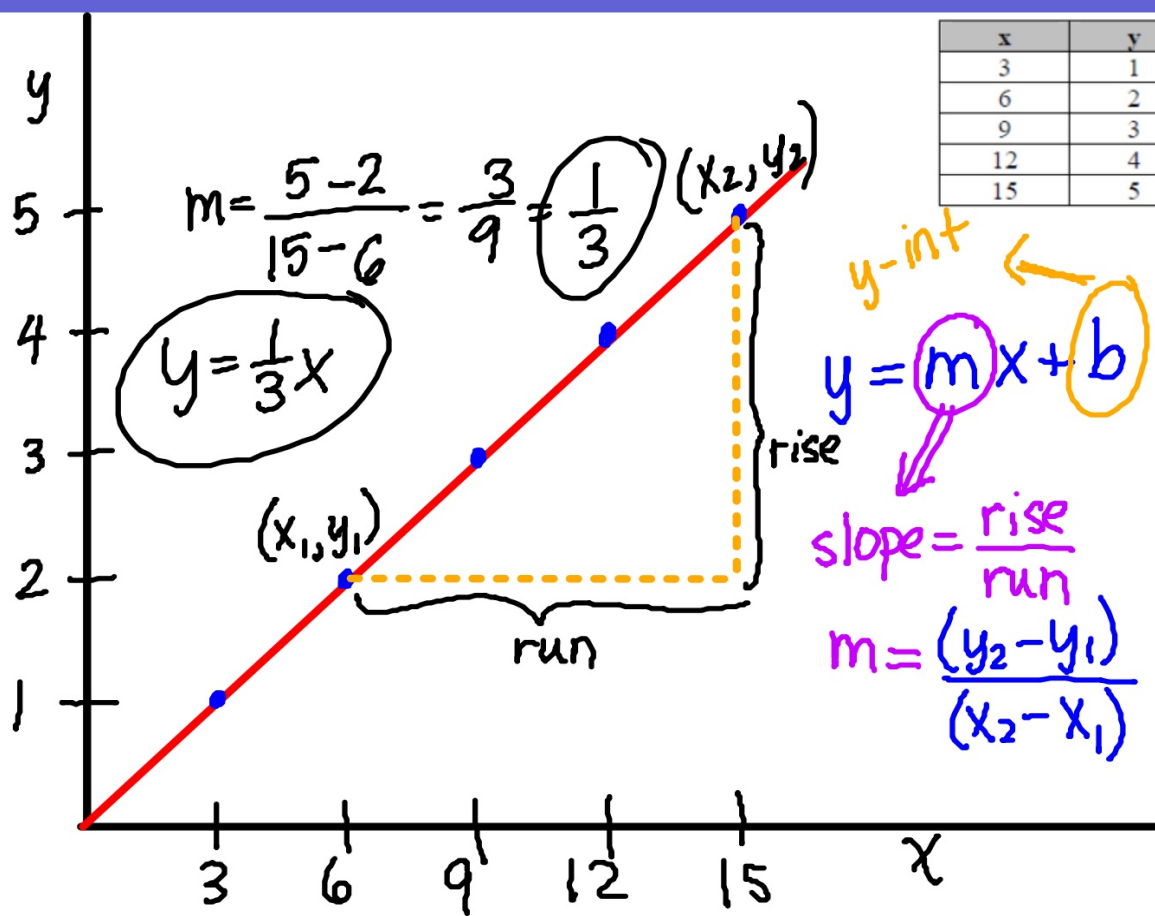
(b) $8,760 = 8.76 \times 10^3$ h

(c) $525,600 = 5.256 \times 10^5$

(d) 3.1536×10^7 s

Variable Relationships (Graphing)





x	y
3	1
6	2
9	3
12	4
15	5

$$m = \frac{5-2}{15-6} = \frac{3}{9} = \frac{1}{3}$$

$$y = \frac{1}{3}x$$

y-int ←

$$y = mx + b$$

slope = $\frac{\text{rise}}{\text{run}}$

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

b vs. a

a	b
1	2
2	8
3	18
4	32
5	50

