

Mathematical Concepts and Skills

giga	G	10^9
mega	M	10^6
kilo	k	10^3
centi	c	10^{-2}
milli	m	10^{-3}
micro	μ	10^{-6}
nano	n	10^{-9}

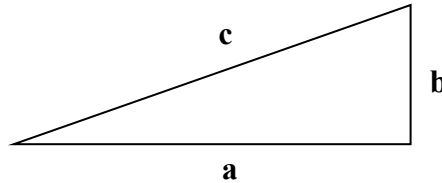
1 in = 2.540 cm
 1 m = 100 cm = 3.281 ft
 1 mi = 5280 ft = 1609 m
 1 hr = 3600 s
 1 day = 86,400 s
 1 year = 365.25 days

⇒ when converting between units, you multiply by conversion factors that equal 1

$$\text{ex: } 1.0 \frac{m}{s} = 1.0 \frac{m}{s} \left(\frac{1 \text{ mi}}{1609 \text{ m}} \right) \left(\frac{3600 \text{ s}}{1 \text{ hr}} \right) = 2.24 \frac{\text{mi}}{\text{hr}}$$

Trig Review:

Pythagorean theorem: $a^2 + b^2 = c^2$



SOH CAH TOA

$$\sin = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan = \frac{\text{opposite}}{\text{adjacent}}$$

$$\theta = \sin^{-1} \left(\frac{O}{H} \right)$$

$$\theta = \cos^{-1} \left(\frac{A}{H} \right)$$

$$\theta = \tan^{-1} \left(\frac{O}{A} \right)$$

Adding Vectors Graphically:

- 1) Draw the first vector to the correct length and in the correct direction.
- 2) Draw the second vector (correct length and direction) starting at the tip of the first
- 3) The resultant vector starts at the tail of the first vector and ends at the tip of the second

Speed and Velocity:

$$\text{speed} = \frac{\text{distance traveled in a given time interval}}{\text{time interval}}$$

$$\text{velocity} = \frac{\text{displacement}}{\text{time interval}} = \frac{\Delta x}{\Delta t}$$