

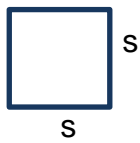
## Math Formula Sheet

### Conversion Table

12 in (inches) = 1 ft (foot)	1 in (inches) = 2.54 cm (centimeters)	1 m (meter) = 3.281 ft
3 ft (feet) = 1 yd (yard)	1 ft (foot) = 0.305 m (meters)	1 m (meter) = 1.094 yd
5280 ft (feet) = 1 mi (miles)	1 yd (yard) = 0.914 m (meters)	1 km = 0.621 mi (mile)
1 mi (mile) = 1.609 km (kilometers)		

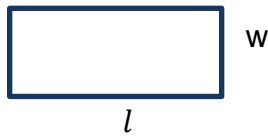
### Metric Chart for Units of Length

kilo = 1000m    hecto = 100m    deka = 10m    meter = m    deci =  $\frac{1}{10}m$     centi =  $\frac{1}{100}m$     milli =  $\frac{1}{1000}m$



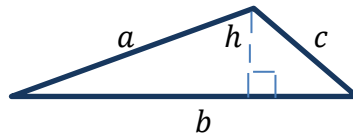
$$P = 4s$$

$$A = s^2$$



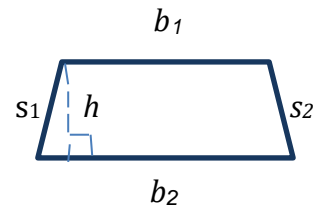
$$P = 2l + 2w$$

$$A = lw$$



$$P = a + b + c$$

$$A = \frac{1}{2}bh$$



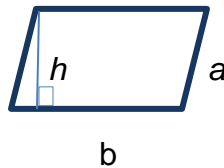
$$P = s_1 + b_1 + s_2 + b_2$$

$$A = \left(\frac{1}{2}\right)h(b_1 + b_2)$$



$$C = 2\pi r \text{ or } C = \pi d$$

$$A = \pi r^2$$



$$P = 2a + 2b$$

$$A = bh$$

$$\frac{\%}{100} = \frac{\text{part}}{\text{whole}} \quad \text{and} \quad \%(as\ decimal) \cdot \text{whole} = \text{part}$$

**Percent of Increase or Decrease:**  $\frac{n}{100} = \frac{\text{difference}}{\text{original amount}}$

**Simple Interest:**  $I = Prt$  and  $A = I + P$

**Compound Interest:**  $A = P\left(1 + \frac{r}{n}\right)^{nt}$  or  $A = Pe^{rt}$

**Slope formula:**  $m = \frac{y_2 - y_1}{x_2 - x_1}$  for line through the points  $(x_1, y_1)$  and  $(x_2, y_2)$

**Slope intercept form:**  $y = mx + b$  where slope is  $m$  and y-intercept is  $b$

**Point-slope form:**  $y - y_1 = m(x - x_1)$  where  $(x_1, y_1)$  is a point on the line

## Math Formula Sheet

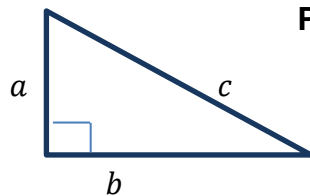
### Factoring:

Difference of two squares:  $(a^2 - b^2) = (a - b)(a + b)$

Sum of cubes:  $(a^3 + b^3) = (a + b)(a^2 - ab + b^2)$

Difference of cubes:  $(a^3 - b^3) = (a - b)(a^2 + ab + b^2)$

**Distance formula:**  $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$     **Midpoint formula:**  $M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$



### Pythagorean Theorem:

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

### Quadratic Formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**Circle:** Center  $(h, k)$

and Radius  $r$

$$(x - h)^2 + (y - k)^2 = r^2$$

**Parabola:** Vertex  $(h, k)$

$$y = a(x - h)^2 + k$$

**Vertex of a quadratic**

$$(h, k) = \left( -\frac{b}{2a}, f\left(-\frac{b}{2a}\right) \right)$$

**Cancellation Properties of Exponentials and Logarithms:** For  $b > 0$  and  $b \neq 1$ ,

$$b^{\log_b x} = x \text{ and } \log_b b^x = x$$

**Logarithmic Function Definition:** For  $x > 0$ ,  $b > 0$ , and  $b \neq 1$

$$y = \log_b x \text{ if and only if } x = b^y$$

### Radians/Degrees conversion:

Degrees to Radians: Multiply by  $\frac{\pi}{180^\circ}$

Radians to Degrees: Multiply by  $\frac{180^\circ}{\pi}$

### Fundamental Identities:

$$\tan \theta = \frac{\sin \theta}{\cos \theta}, \quad \cot \theta = \frac{\cos \theta}{\sin \theta}, \quad \csc \theta = \frac{1}{\sin \theta}, \quad \sec \theta = \frac{1}{\cos \theta}, \quad \cot \theta = \frac{1}{\tan \theta}$$

### Cofunction Identities:

$$\cos(90^\circ - \theta) = \sin \theta, \quad \tan(90^\circ - \theta) = \cot \theta, \quad \sec(90^\circ - \theta) = \csc \theta$$

$$\sin(90^\circ - \theta) = \cos \theta, \quad \cot(90^\circ - \theta) = \tan \theta, \quad \csc(90^\circ - \theta) = \sec \theta$$

**Law of Cosines** in any  $\triangle ABC$ ,

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

**Law of Sines** in any  $\triangle ABC$ ,

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$