

# Ontario Grade 12 University Math Formula Sheet

## **Pythagorean Theorem**

 $a^2 + b^2 = c^2$ , where c is the length of the hypotenuse

#### **Linear Relations**

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

# **Quadratic Formula**

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

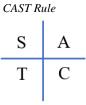
# **Trigonometry**

$$\sin\theta = \frac{opposite}{hypotenuse}$$
 
$$\cos\theta = \frac{adjacent}{hypotenuse}$$
 
$$\tan\theta = \frac{opposite}{adjacent}$$

$$\csc\theta = \frac{hypotenuse}{opposite}$$
 
$$\sec\theta = \frac{hypotenuse}{adjacent}$$
 
$$\cot\theta = \frac{adjacent}{opposite}$$

$$\begin{array}{c} nuse \\ \hline site \\ nuse \\ \hline nuse \\ \hline nt \\ te \\ \hline \end{array} \qquad \begin{array}{c} Sine \ Law \\ \hline a \\ \hline a \\ \hline = \frac{s}{a} \\ \hline Cosine \ Law \\ \hline a^2 = b^2 + a \\ \hline \end{array}$$

Sine Law
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$
Cosine Law
$$a^{2} = b^{2} + c^{2} - 2bc \cos(A)$$



$$\pi$$
 radians = 180°

Sum and Difference Identities

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$
  
$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

$$cos(A + B) = cos A cos B - sin A sin B$$
  

$$cos(A - B) = cos A cos B + sin A sin B$$

**Area and Volume:** for ALL calculations using  $\pi$ , <u>always use</u>  $\pi = 3.14$ 

$$\frac{always\ use}{\pi = 3.14}$$

Area of a **circle** with radius *r*:

Circumference of a circle with radius r

$$A = \pi r^2$$

$$C = 2\pi r$$

Area of a **triangle** with base b and height h:

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

Volume of **Prism**:

V = area of base x height of the prism

Volume of Pyramid:

$$V = \frac{1}{3} \times \text{(the volume of the enclosing prism)}$$

Volume of **Cylinder** with height *h* and radius *r*:

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

Volume of **Sphere** with radius *r*:

$$V = \frac{4}{3}\pi r^3$$