## Trigonometry

| | |
|---|---|
| $\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$ | $\csc A = \frac{\text{hypotenuse}}{\text{opposite}} = \frac{1}{\sin A}$ |
| $\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$ | $\sec A = \frac{\text{hypotenuse}}{\text{adjacent}} = \frac{1}{\cos A}$ |
| $\tan A = \frac{\text{opposite}}{\text{adjacent}}$ | $\cot A = \frac{\text{adjacent}}{\text{opposite}} = \frac{1}{\tan A}$ |

$$\frac{\sin A}{\cos A} = \tan A$$

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

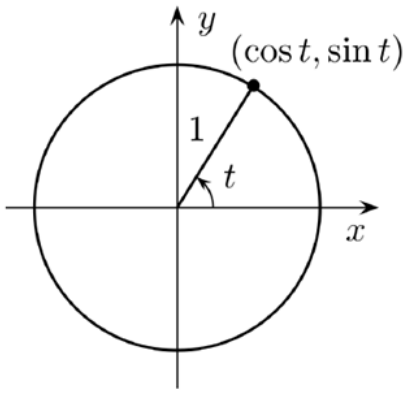
$$\sin A = \cos(90° - A)$$
$$\cos A = \sin(90° - A)$$

$$\sin 2A = 2(\sin A)(\cos A)$$
$$\cos 2A = \cos^2 A - \sin^2 A$$

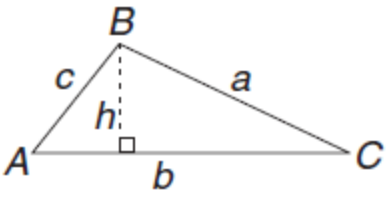
$$\sin^2 A = 1 - \cos^2 A$$
$$\sin^2 A + \cos^2 A = 1$$
$$\cos^2 A = 1 - \sin^2 A$$

$$\tan^2 A + 1 = \sec^2 A$$
$$\sec^2 A - \tan^2 A = 1$$
$$\sec^2 A - 1 = \tan^2 A$$

$$1 + \cot^2 A = \csc^2 A$$
$$\cot^2 A = \csc^2 A - 1$$
$$1 = \csc^2 A - \cot^2 A$$



## Trigonometry Formulas




Area = $\frac{1}{2}ab \sin C$

Law of sines: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Law of cosines: $b^2 = a^2 + c^2 - 2ac(\cos B)$