

## Trig Identity Reference Sheet

### Reciprocal Identities:

$$\begin{array}{l} \tan \theta = \frac{\sin \theta}{\cos \theta} \\ \sec \theta = \frac{1}{\cos \theta} \end{array} \quad \begin{array}{l} \cot \theta = \frac{1}{\tan \theta} = \frac{\cos \theta}{\sin \theta} \\ \csc \theta = \frac{1}{\sin \theta} \end{array}$$

### Pythagorean Identities:

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\csc^2 \theta = 1 + \cot^2 \theta$$

$$\sec^2 \theta = 1 + \tan^2 \theta$$

### Negative Angle Identities:

$$\begin{array}{l} \sin(-\theta) = -\sin \theta \\ \cos(-\theta) = \cos \theta \\ \tan(-\theta) = -\tan \theta \end{array}$$

### Double Angle Identities:

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$\tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$$

$$\begin{array}{l} \cos 2\theta = \cos^2 \theta - \sin^2 \theta \\ \quad = 2 \cos^2 \theta - 1 \\ \quad = 1 - 2 \sin^2 \theta \end{array}$$

### Sum and Difference Identities:

$$\begin{array}{l} \sin(A + B) = \sin A \cos B + \cos A \sin B \\ \cos(A + B) = \cos A \cos B - \sin A \sin B \\ \tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B} \end{array}$$

$$\begin{array}{l} \sin(A - B) = \sin A \cos B - \cos A \sin B \\ \cos(A - B) = \cos A \cos B + \sin A \sin B \\ \tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B} \end{array}$$