Trigonometric Ratios:

Sine: $\sin \theta = \frac{y}{r}$

Cosecant: $\csc \theta = \frac{r}{y}$

Cosine: $\cos \theta = \frac{x}{r}$

Secant: $\sec \theta = \frac{r}{x}$

Tangent: $\tan \theta = \frac{y}{x}$

Cotangent: $\cot \theta = \frac{x}{y}$

Reciprocals and Quotients:

$$\csc \theta = \frac{1}{\sin \theta}$$

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

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

Pythagorean Identities:

$\sin^2\theta + \cos^2\theta = 1$ $\qquad$ $1 + \tan^2\theta = \sec^2 \theta$ $\qquad$ $1 + \cot^2\theta = \csc^2\theta$

Sum and Difference Identities:

$\cos (\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$ $\qquad$ $\sin (\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$

$\cos (\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$ $\qquad$ $\sin (\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$

Double-Angle Identities:

$\cos 2\theta = \cos^2 \theta - \sin^2 \theta$ $\qquad\qquad$ $\sin 2\theta = 2\sin\theta \cos\theta$

$\qquad = 2 \cos^2 \theta - 1$

$\qquad = 1 - 2 \sin^2 \theta$

Other Important Identities:

$\sin(-\theta) = -\sin \theta$ $\qquad\qquad\qquad\qquad$ $\cos(-\theta) = \cos \theta$