

Reciprocal Identities

$$\begin{aligned}\csc \theta &= 1/\sin \theta \\ \sec \theta &= 1/\cos \theta \\ \cot \theta &= 1/\tan \theta\end{aligned}$$

Pythagorean Identities

$$\begin{aligned}\sin^2 \theta + \cos^2 \theta &= 1 \\ \sec^2 \theta &= 1 + \tan^2 \theta \\ \csc^2 \theta &= 1 + \cot^2 \theta\end{aligned}$$

Addition & Subtraction Formulas

$$\begin{aligned}\sin(\alpha \pm \beta) &= \sin(\alpha) \cos(\beta) \pm \sin(\beta) \cos(\alpha) \\ \cos(\alpha \pm \beta) &= \cos(\alpha) \cos(\beta) \mp \sin(\beta) \sin(\alpha) \\ \tan(\alpha \pm \beta) &= \frac{\tan(\alpha) \pm \tan(\beta)}{1 \mp \tan(\alpha) \tan(\beta)}\end{aligned}$$

Corelated Angle Identities

$$\begin{aligned}\sin(\pi/2 \pm \theta) &= \cos(\theta) \\ \cos(\pi/2 \pm \theta) &= \mp \sin(\theta) \\ \tan(\pi/2 \pm \theta) &= \mp \cot(\theta) \\ \sin(3\pi/2 \pm \theta) &= -\cos(\theta) \\ \cos(3\pi/2 \pm \theta) &= \pm \sin(\theta) \\ \tan(3\pi/2 \pm \theta) &= \mp \cot(\theta)\end{aligned}$$

Double Angle Formulas

$$\begin{aligned}\sin(2\theta) &= 2 \sin(\theta) \cos(\theta) \\ \cos(2\theta) &= \cos^2(\theta) - \sin^2(\theta) \\ &= 2 \cos^2(\theta) - 1 \\ &= 1 - 2 \sin^2(\theta) \\ \tan(2\theta) &= \frac{2 \tan(\theta)}{1 - \tan^2(\theta)}\end{aligned}$$

Quotient Identities

$$\begin{aligned}\tan \theta &= \sin \theta / \cos \theta \\ \cot \theta &= \cos \theta / \sin \theta\end{aligned}$$

Related Angle Identities

$$\begin{aligned}\sin(\pi \mp \theta) &= \pm \sin(\theta) \\ \cos(\pi \mp \theta) &= -\cos(\theta) \\ \tan(\pi \mp \theta) &= \mp \tan(\theta) \\ \sin(2\pi - \theta) &= -\sin(\theta) \\ \cos(2\pi - \theta) &= \cos(\theta) \\ \tan(2\pi - \theta) &= -\tan(\theta) \\ \sin(-\theta) &= -\sin(\theta) \\ \cos(-\theta) &= \cos(\theta) \\ \tan(-\theta) &= -\tan(\theta)\end{aligned}$$



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