

## Reciprocal Identities

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

## Pythagorean Identities

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

## Quotient Identities

$$\tan x = \frac{\sin x}{\cos x} \qquad \cot x = \frac{\cos x}{\sin x}$$

## Even / Odd Identities

$$\begin{aligned}\sin(-x) &= -\sin(x) & \cos(-x) &= \cos(x) & \tan(-x) &= -\tan(x) \\ \csc(-x) &= -\csc(x) & \sec(-x) &= \sec(x) & \cot(-x) &= -\cot(x)\end{aligned}$$

## Sum / Difference Identities

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

## Double Angle Formulas

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