

Fundamental Identities

The reciprocal identities:

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

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

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

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

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

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

The quotient identities:

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

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

Even-Odd Identities

The cosine and secant functions are even.

$$\cos(-t) = \cos t$$

$$\sec(-t) = \sec t$$

The sine, cosecant, tangent, and cotangent functions are odd.

$$\sin(-t) = -\sin t$$

$$\csc(-t) = -\csc t$$

$$\tan(-t) = -\tan t$$

$$\cot(-t) = -\cot t$$

The Pythagorean Identities

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

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

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