

# Fundamental Identities

2-8-08

## Basic Trig Identities

$$\csc \theta =$$

$$\sec \theta =$$

$$\cot \theta =$$

$$\sin \theta =$$

$$\cos \theta =$$

$$\tan \theta =$$

$$\tan \theta =$$

$$\cot \theta =$$

## Pythagorean Identities

**Cofunction Identities**

$$\sin\left(\frac{\pi}{2} - \theta\right) =$$

$$\cos\left(\frac{\pi}{2} - \theta\right) =$$

$$\tan\left(\frac{\pi}{2} - \theta\right) =$$

$$\csc\left(\frac{\pi}{2} - \theta\right) =$$

$$\sec\left(\frac{\pi}{2} - \theta\right) =$$

$$\cot\left(\frac{\pi}{2} - \theta\right) =$$

**Odd-Even Identities**

$$\sin(-x) =$$

$$\cos(-x) =$$

$$\tan(-x) =$$

$$\csc(-x) =$$

$$\sec(-x) =$$

$$\cot(-x) =$$

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Evaluate using Pythagorean identities rather than reference triangles.

1. Find  $\sin \theta$  and  $\tan \theta$  if  $\cos \theta = 0.8$  and  $\tan \theta < 0$ .

2. Find  $\sec \theta$  and  $\csc \theta$  if  $\tan \theta = 3$  and  $\cos \theta > 0$ .

3. If  $\sin \theta = 0.73$ , find  $\cos\left(\frac{\pi}{2} - \theta\right)$ .

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4. If  $\cot(-\theta) = 7.89$ , find  $\tan\left(\theta - \frac{\pi}{2}\right)$ .

5. Simplify.

$$\cot x \sin x$$

$$\frac{\sin^2 x + \tan^2 x + \cos^2 x}{\sec x}$$

6. Simplify.

$$\cot(-x) \tan(-x)$$

**7. Simplify.**

$$\frac{1 + \tan x}{1 + \cot x}$$

$$\sin \theta - \tan \theta \cos \theta + \cos \left( \frac{\pi}{2} - \theta \right)$$

**8. Simplify.**

$$\frac{1}{1 - \sin x} + \frac{1}{1 + \sin x}$$

$$\sin^2 x + \frac{2}{\csc x} + 1$$

**9. Simplify.**

$$\sec^2 x - \sec x + \tan^2 x$$

$$\frac{1 - \sin^2 x}{1 + \sin x}$$