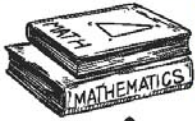


Name :

Class :



# Trigonometric Identities



A Trigonometric Identity is an equation involving the trigonometric functions that holds for all values of the variable.

## Trigonometric Identities

### Reciprocal Identities

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

### Pythagorean Identities

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

### Half-Angle Formulas

$$\begin{aligned} \sin\left(\frac{\theta}{2}\right) &= \pm \sqrt{\frac{1 - \cos \theta}{2}} \\ \cos\left(\frac{\theta}{2}\right) &= \pm \sqrt{\frac{1 + \cos \theta}{2}} \\ \tan\left(\frac{\theta}{2}\right) &= \frac{1 - \cos \theta}{\sin \theta} \end{aligned}$$



Find the values using Quotient and reciprocal Identities

1) If  $\csc x = \frac{9}{5}$  find the  $\sin x$

$$\sin x = \frac{5}{9}$$

2) If  $\sin x = \frac{5}{13}$  and  $\cos x = \frac{6}{13}$  find the  $\tan x$

$$\tan x = \frac{5}{6}$$

3) If  $\sec x = \frac{2}{5}$  find the  $\cos x$

$$\cos x = \frac{5}{2}$$

4) If  $\sin x = \frac{3}{7}$  and  $\cot x = \frac{4}{5}$  find the  $\sec x$

$$\sec x = \frac{28}{15}$$

5) If  $\tan x = \frac{2}{3}$  find the  $\cot x$

$$\cot x = \frac{3}{2}$$

6) If  $\cos x = \frac{12}{13}$  and  $\cot x = \frac{14}{13}$  find the  $\csc x$

$$\csc x = \frac{6}{7}$$