

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 of following using trigonometric identities

1) $\frac{\cos^2 t - 1}{\sin^2 t - 1}$

$\tan^2 t$

2) $\frac{2 \sin t \cos t + (\sin t - \cos t)^2}{\sec t}$

$\cos t$

3) $\cos t \csc t (\sec^2 t - 1)$

$\tan t$

4) $\frac{\sin t (1 + \sin t)}{1 - \cos^2 t} - 1$

$\csc t$

5) $\frac{1 - \tan^2 t}{1 + \tan^2 t} + 1$

$2 \cos^2 t$

6) $\frac{1 + \tan^2 t + \sec^2 t \cot^2 t}{\csc^2 t + \cot^2 t \csc^2 t}$

$\tan^2 t$