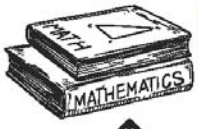
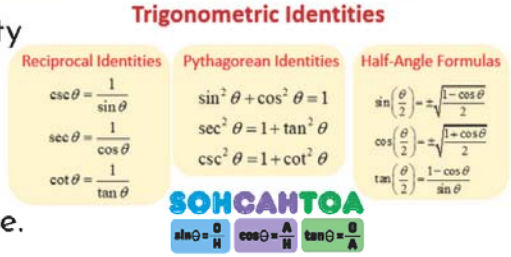
Name : Class :



Trigonometric Identities

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



Prove the following Trigonometric Identities

1) $\frac{\tan^2\theta - \sec^2\theta}{\cos\theta} = -\sec\theta$

L.H.S

$= \frac{\tan^2\theta - (1 + \tan^2\theta)}{\cos\theta}$ $1 + \tan^2\theta = \sec^2\theta$

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

$= -\sec\theta$

$=$ R.H.S

2) $1 - \sin^2\theta = \frac{\sin^2\theta}{\tan^2\theta}$

R.H.S $= \frac{\sin^2\theta}{\tan^2\theta}$

$= \frac{\sin^2\theta}{\frac{\sin^2\theta}{\cos^2\theta}}$

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

$= 1 - \sin^2\theta =$ L.H.S

3) $\tan\theta \cos\theta = \sin\theta$

L.H.S

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

$= \sin\theta$

$=$ R.H.S

4) $\frac{\sin^2\theta}{1 - \cos\theta} = 1 + \cos\theta$

L.H.S $\sin^2\theta + \cos^2\theta = 1$

$= \frac{1 - \cos^2\theta}{1 - \cos\theta}$

$= \frac{(1 - \cos\theta)(1 + \cos\theta)}{1 - \cos\theta}$

$= 1 + \cos\theta$

$=$ R.H.S

5) $\tan\theta \csc\theta = \sec\theta$

L.H.S

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

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

$= \sec\theta$

$=$ R.H.S

6) $\cos^2\theta = \sin^2\theta + 2\cos^2\theta - 1$

R.H.S $\sin^2\theta + \cos^2\theta = 1$

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

$= \cos^2\theta$

$=$ L.H.S