

## Trig Proofs - Intro

Prove the following identities.

1.  $\cos x \tan x = \sin x$
2.  $\csc x \tan x = \sec x$
3.  $\sec x \cot x \sin x = 1$
4.  $\csc x \tan x \cos x = 1$
5.  $\sin^2 x \sec x \csc x = \tan x$
6.  $\cos^2 \theta \csc \theta \sec \theta = \cot \theta$
7.  $\tan x + \cot x = \csc x \sec x$
8.  $\sin \theta + \cot \theta \cos \theta = \csc \theta$
9.  $\csc x - \sin x = \cot x \cos x$
10.  $\sec x - \cos x = \sin x \tan x$
11.  $\tan x(\sin x + \cot x \cos x) = \sec x$
12.  $\cos x(\sec x + \cos x \csc^2 x) = \csc^2 x$
13.  $(1 + \sin A)(1 - \sin A) = \cos^2 A$
14.  $(\sec x - 1)(\sec x + 1) = \tan^2 x$
15.  $(\cos x - \sin x)^2 = 1 - 2 \cos x \sin x$
16.  $(1 - \tan x)^2 = \sec^2 x - 2 \tan x$
17.  $(\tan x + \cot x)^2 = \sec^2 x + \csc^2 x$
18.  $(\cos A - \sec A)^2 = \tan^2 A - \sin^2 A$
19.  $\frac{\csc^2 x - 1}{\cos x} = \cot x \csc x$
20.  $\frac{1 - \cos^2 x}{\tan x} = \sin x \cos x$
21.  $\frac{\sec^2 x - 1}{\sin x} = \tan x \sec x$
22.  $\frac{1 + \cot^2 x}{\sec^2 x} = \cot^2 x$
23.  $\frac{\sec x}{\sin x} - \frac{\sin x}{\cos x} = \cot x$
24.  $\frac{\csc x}{\cos x} - \frac{\cos x}{\sin x} = \tan x$
25.  $\frac{1}{1 - \cos x} + \frac{1}{1 + \cos x} = 2 \csc^2 x$
26.  $\frac{1}{\sec x - \tan x} + \frac{1}{\sec x + \tan x} = 2 \sec x$
27.  $\sec x(\sec x - \cos x) = \tan^2 x$
28.  $\tan x(\cot x + \tan x) = \sec^2 x$
29.  $\sin x(\csc x - \sin x) = \cos^2 x$
30.  $\cos x(\sec x - \cos x) = \sin^2 x$
31.  $\csc^2 x - \cos^2 x \csc^2 x = 1$
32.  $\cos^2 x + \cos^2 x \tan^2 x = 1$
33.  $\sec^2 x + \tan^2 x \sec^2 x = \sec^4 x$
34.  $\cot^2 x \csc^2 x - \cot^2 x = \cot^4 x$
35.  $\cos^4 x - \sin^4 x = 1 - 2 \sin^2 x$
36.  $\sec^4 x - \tan^4 x = 1 + 2 \tan^2 x$
37.  $\frac{1}{\sin x \cos x} - \frac{\cos x}{\sin x} = \tan x$
38.  $\frac{\sec x}{\sin x} - \frac{\sin x}{\cos x} = \cot x$
39.  $\frac{\sin x}{\csc x} + \frac{\cos x}{\sec x} = 1$
40.  $\frac{1}{\csc^2 x} + \frac{1}{\sec^2 x} = 1$
41.  $\frac{1}{1 + \cos x} = \csc^2 x - \csc x \cot x$
42.  $\frac{\cos x}{\sec x - 1} - \frac{\cos x}{\tan^2 x} = \cot^2 x$
43.  $\frac{\sin x}{1 - \cos x} + \frac{1 - \cos x}{\sin x} = 2 \csc x$
44.  $\frac{\sec x}{\sec x - \tan x} = \sec^2 x + \sec x \tan x$
45.  $\frac{1 + \sin x}{1 - \sin x} = 2 \sec^2 x + 2 \sec x \tan x - 1$
46.  $\sin^3 x \cos^2 x = \sin^3 x - \sin^5 x$
47.  $\sin^3 x \cos^2 x = \cos^2 x \sin x - \cos^4 x \sin x$
48.  $\sec^2 x + \csc^2 x = \sec^2 x \csc^2 x$
49.  $\frac{1 - 3 \cos x - 4 \cos^2 x}{\sin^2 x} = \frac{1 - 4 \cos x}{1 - \cos x}$
50.  $\frac{\sec^2 x - 6 \tan x + 7}{\sec^2 x - 5} = \frac{\tan x - 4}{\tan x + 2}$