

## Trig Proofs - Review

Prove the following identities.

1.  $\sec x - \sin x \tan x = \cos x$
2.  $\frac{1 + \cos x}{\sin x} = \csc x + \cot x$
3.  $\frac{\sec x \sin x}{\tan x + \cot x} = \sin^2 x$
4.  $\frac{\sec x}{\cos x} - \frac{\tan x}{\cot x} = 1$
5.  $\cos^2 x - \sin^2 x = 1 - 2\sin^2 x$
6.  $\csc^2 x \tan^2 x - 1 = \tan^2 x$
7.  $\frac{\sec^2 x}{\sec^2 x - 1} = \csc^2 x$
8.  $2 \cos x \tan x \csc x = 2$
9.  $6 \cos x \left( \frac{1}{\cos x} - \frac{\cot x}{\csc x} \right) = 6 \sin^2 x$
10.  $\frac{\cot^2 x}{\csc x} \sec^2 x = \csc x$
11.  $\frac{1 - \tan^2 x}{1 + \tan^2 x} = \cos 2x$
12.  $\frac{1 + \cos x}{\sin^3 x} = \frac{\csc x}{1 - \cos x}$
13.  $\frac{\tan x}{\sec x} + \frac{\cot x}{\csc x} = \sin x + \cos x$
14.  $\frac{\sin x + \tan x}{1 + \sec x} = \sin x$
15.  $1 + \tan^2 x + \tan x \sec x = \frac{1 + \sin x}{\cos^2 x}$

Answers:

16.  $\frac{-\sqrt{2} - \sqrt{6}}{4}$
17.  $\frac{\sqrt{2} - \sqrt{6}}{4}$
18.  $2 + \sqrt{3}$
19.  $-\sqrt{2} - \sqrt{6}$
20.  $\frac{8 - 3\sqrt{5}}{15}$
21.  $\frac{7}{25}$
22.  $\frac{4\sqrt{5} - 6}{15}$
23.  $\frac{4\sqrt{5}}{9}$
24.  $\frac{108 + 50\sqrt{5}}{19}$
25.  $\frac{-24}{7}$

Solve:

16.  $\cos 165^\circ$
17.  $\sin 345^\circ$
18.  $\tan 255^\circ$
19.  $\sec 105^\circ$

Given  $\cos A = \frac{-2}{3}$ ,  $\sin A < 0$ ,  $\cos B < 0$ , and

$\sin B = \frac{3}{5}$ , find:

20.  $\cos(A - B)$
21.  $\cos 2B$
22.  $\sin(A + B)$
23.  $\sin 2A$
24.  $\tan(A - B)$
25.  $\tan 2B$