

## WORKSHEET

## VERIFYING IDENTITIES

Verify these identities by changing only one side of the equation into the other side. You must leave one side alone as you are working these problems.

1)  $\frac{\sin^2 x}{1 + \cos x} + \cos x = 1$

2)  $\frac{\sin x \cot x + \cos x}{\sin x} = 2 \cot x$

3)  $\frac{1 + \tan^2 x}{\tan^2 x} = \csc^2 x$

4)  $\frac{1 - \sin^2 x}{1 - \cos^2 x} = \cot^2 x$

5)  $\frac{\sin x}{\csc x} + \frac{\cos x}{\sec x} = 1$

6)  $\frac{1 + \cot A}{\csc A} = \sin A + \cos A$

7)  $\frac{1}{\tan x} + \tan x = \sec x \csc x$

8)  $\cos \theta + \sin \theta \tan \theta = \sec \theta$

## WORKSHEET

## MORE VERIFYING IDENTITIES

Verify these identities by changing only one side of the equation into the other side. You must leave one side alone as you are working these problems.

1)  $\csc^2 x (1 - \cos^2 x) = 1$

2)  $(\sin x + \cos x)^2 - (\sin x - \cos x)^2 = 4 \sin x \cos x$

3)  $\sin x (\csc x + \sin x \sec^2 x) = \sec^2 x$

4)  $\cot^2 x + 5 = \csc^2 x + 4$

5)  $\sin x \tan x + \cos x = \sec x$

6)  $\frac{\sec x}{\tan x + \cot x} = \sin x$

7)  $\frac{(\sin x - \cos x)^2}{\cos x} = \sec x - 2 \sin x$

Things to get you started when simplifying and verifying identities.

- 1) If you see squared things, especially being added or subtracted, think PYTHAGOREAN identities and substitute an equivalent expression.
- 2) No squared things? See if you can use a reciprocal identity and then use your algebra skills.
- 3) As a last resort, change everything to sine and cosine and then use your algebra skills.

## Examples

Verify each identity. You are allowed to only change one side of the equation. You are proving that one side is equal to the other.

1)  $\sin x + \cos x \cot x = \csc x$

2)  $2 \cos^2 x + 1 - \sin^2 x = 3 \cos^2 x$

3)  $\frac{\sec x - \cos x}{\tan x} = \sin x$

4)  $\frac{1}{1 + \sin x} + \frac{1}{1 - \sin x} = 2 \sec^2 x$