$\sin\theta + \cos\theta\cot\theta$

$\sin + \cos \cdot \frac{\cos}{\sin}$

$\frac{\sin}{\sin}\frac{\sin}{1} + \frac{\cos^2}{\sin}$

$\frac{\sin^2}{\sin} + \frac{\cos^2}{\sin} = \frac{\sin^2+\cos^2}{\sin} = \frac{1}{\sin} = \csc\theta$

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

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

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

$\tan^2\theta + 1 = \sec^2\theta$

$1 + \cot^2\theta = \csc^2\theta$

$\frac{\sec\theta}{\sin\theta} - \frac{\sin\theta}{\cos\theta} \cdot \frac{\sin}{\sin}$

$\frac{1}{\frac{\cos}{\sin}} \rightarrow \frac{1}{\cos\cdot\sin} - \frac{\sin^2}{\cos\cdot\sin} = \frac{\cos^2}{\cos\cdot\sin}$

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

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

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

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

$\tan^2\theta + 1 = \sec^2\theta$

$1 + \cot^2\theta = \csc^2\theta$

$\sec\theta\cot\theta - \cot\theta\cos\theta$

$\frac{\sec\theta}{\cot\theta + \tan\theta}$

1 +

$\sin x(1 + \cot^2 x)$

Verifying Trig Identities:

Showing that the two sides of the equation really are equal.

When trying to verify/prove an identity you CAN'T do the following:

- Move terms from one side of the equation to the other side
- Multiply/divide/square/square root both sides of the equation
- Add/Subtract from both sides of the equation

You are NOT solving

You are trying to show the two sides of the equation are equal, therefore, you can't do anything that requires them to be equal.

Two basic techniques:

- Work on one side only and make it look like the other side.

or

- Work on both sides until they look the same.

Verify this trig identity.

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

$$\frac{\frac{1}{\cos} - \frac{\cos}{1}\cdot\frac{\cos}{\cos}}{\frac{\sin}{\cos}}$$

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

$$\frac{\sin^2}{\sin}$$

$$\sin x = \sin x$$

Verify this identity:

$$\frac{\sin x}{\tan x} + \frac{\cos x}{\cot x} = \sin x + \cos x$$

$$\frac{\sin}{\frac{\sin}{\cos}} + \frac{\cos}{\frac{\cos}{\sin}}$$

$$\sin\cdot\frac{\cos}{\sin} + \cos\cdot\frac{\sin}{\cos}$$

$$\cos x + \sin x = \sin x + \cos x$$

Verify this identity:

$$\tan x + \cot x = \sec x \cdot \csc x$$

$$\frac{\sin}{\sin}\cdot\frac{\sin}{\cos} + \frac{\cos}{\sin}\cdot\frac{\cos}{\cos} \qquad \frac{1}{\cos}\cdot\frac{1}{\sin}$$

$$\frac{\sin^2 + \cos^2}{\sin\cos} \qquad \frac{1}{\cos\cdot\sin}$$

$$\frac{1}{\sin x\cdot\cos x} = \frac{1}{\cos x\cdot\sin x}$$

Verify this identity:

$$\sin^2 x \cdot \tan^2 x = \tan^2 x - \sin^2 x$$

$$\sin^2\cdot\frac{\sin^2}{\cos^2} \qquad \frac{\sin^2}{\cos^2} - \frac{\sin^2}{1}\cdot\frac{\cos^2}{\cos^2}$$

$$\frac{\sin^4}{\cos^2} = \frac{\sin^2 - \sin^2\cos^2}{\cos^2}$$

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

$$\frac{\sin^2(\sin^2)}{\cos^2}$$

$$\frac{\sin^4 x}{\cos^2 x} = \frac{\sin^4 x}{\cos^2 x}$$

You should now be able to complete Hwk #32

Practice Sheet Sec 14-1