Warm Up

Prove the following identities:

$$\boxed{\frac{1}{\boxed{\cot x}}} = \sin x \,\boxed{\sec x}$$

$$\tan x$$

$$\frac{\sin x}{\cos x}$$

$$\sin x \left(\frac{1}{\cos x}\right)$$

$$\frac{\sin x}{\cos x}$$

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

$$\sin^2 \theta$$

$$\sin^2 \theta$$

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

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

$$\sin^2 \theta$$

Questions from last night's homework?

$$\tan\theta\cos\theta = \sin\theta$$

$$\cot\theta\sec\theta = \csc\theta$$

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

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

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

Questions from last night's homework?

② $\boxed{\cot\theta}\,\boxed{\sec\theta} = \boxed{\csc\theta}$

$\boxed{\cancel{\dfrac{\cos\theta}{\sin\theta}}\left[\dfrac{1}{\cancel{\cos\theta}}\right]} \quad \boxed{\dfrac{1}{\sin\theta}}$

$\boxed{\dfrac{1}{\sin\theta}}$

③ $\dfrac{\boxed{1+\cot^2\theta}}{\csc^2\theta} = \boxed{1}$

$\dfrac{\csc^2\theta}{\csc^2\theta}$

$\boxed{1}$

④ $\dfrac{\tan^2\theta}{\boxed{1+\tan^2\theta}} = \boxed{\sin^2\theta}$

$\dfrac{\boxed{\tan^2\theta}}{\boxed{\sec^2\theta}}$

$\dfrac{\sin^2\theta}{\cos^2\theta} \div \dfrac{1}{\cos^2\theta}$

$\dfrac{\sin^2\theta}{\cancel{\cos^2\theta}} \times \dfrac{\cancel{\cos^2\theta}}{1}$

$\boxed{\sin^2\theta}$

⑤ $\dfrac{\boxed{\tan^2\theta}}{\sin^2\theta} = \boxed{1+\tan^2\theta}$

$\dfrac{\cancel{\sin^2\theta}}{\cos^2\theta} \times \dfrac{1}{\cancel{\sin^2\theta}}$

$\dfrac{1}{\cos^2\theta}$

$\sec^2\theta$

$\boxed{1+\tan^2\theta}$

Trig Identities

$\tan\theta = \dfrac{\sin\theta}{\cos\theta}$ $\cot\theta = \dfrac{\cos\theta}{\sin\theta}$	$\sin^2\theta + \cos^2\theta = 1$ $\tan^2\theta + 1 = \sec^2\theta$ $1 + \cot^2\theta = \csc^2\theta$
$\csc\theta = \dfrac{1}{\sin\theta}$ $\sec\theta = \dfrac{1}{\cos\theta}$ $\cot\theta = \dfrac{1}{\tan\theta}$	$\sin\theta = \dfrac{1}{\csc\theta}$ $\cos\theta = \dfrac{1}{\sec\theta}$ $\tan\theta = \dfrac{1}{\cot\theta}$

Strategies for Proving Identities:
● Work on the most complex side and simplify so it has the same form as the simpler side
● Methods used in simplifying: direct substitution, factoring, finding a common denominator, multiplying by the conjugate

Prove the following identities:

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

Pythagorean

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

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

$$\frac{\csc \theta}{\cot^2 \theta} = \tan \theta \sec \theta$$

Homework