WARMUP

Copy these identities into your notes:

BASIC TRIG IDENTITIES:

Quotient: $\tan\theta = \frac{\sin\theta}{\cos\theta}$ $\quad \cot\theta = \frac{\cos\theta}{\sin\theta}$

Reciprocal: $\csc\theta = \frac{1}{\sin\theta}$ $\quad \sec\theta = \frac{1}{\cos\theta}$ $\quad \cot\theta = \frac{1}{\tan\theta}$

Pythagorean: $\sin^2\theta + \cos^2\theta = 1 \Rightarrow \sin^2\theta = 1 - \cos^2\theta \Rightarrow \cos^2\theta = 1 - \sin^2\theta$

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

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

Section 6.3 Trig Identities

An identity is an equation that is true for any number.

ex: $(x+1)^2 = x^2 + 2x + 1$

Establish the identity:

ex: $\sec\theta \cdot \sin\theta = \tan\theta$

To do these problems, rewrite the more complicated side and use our trig identities to transform the expression to what's on the other side

$$\sec\theta \cdot \sin\theta = \frac{1}{\cos\theta} \cdot \frac{\sin\theta}{1}$$

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

$$= \tan\theta$$

ex: $\sin\theta \cdot \csc\theta - \cos^2\theta = \sin^2\theta$

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

$= 1 - \cos^2\theta$

$= \sin^2\theta$

Assignment p480 1, 5, 6, 9, 13, 15

Establish each identity

1) $\csc\theta \cdot \cos\theta = \cot\theta$

5) $\cos\theta(\tan\theta + \cot\theta) = \csc\theta$

6) $\sin\theta(\cot\theta + \tan\theta) = \sec\theta$

9) $(\sec\theta - 1)(\sec\theta + 1) = \tan^2\theta$

13) $\cos^2\theta(\tan^2\theta + 1) = 1$

15) $(\sin\theta + \cos\theta)^2 + (\sin\theta - \cos\theta)^2 = 2$

5) $\cos\theta(\tan\theta + \cot\theta) = \csc\theta$

$\cos\theta(\tan\theta + \cot\theta)$

$= \frac{\cos\theta}{1}\left(\frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}\right)$

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

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

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

$= \frac{1}{\sin\theta}$

$= \csc\theta$

$\frac{1}{\cos\theta} = \sec\theta$

$\frac{1}{\cos^2\theta} = \sec^2\theta$