November 13

Using other trig functions, write as many different expression as you can write that are equal to tan(x)?

November 13

Students will verbally explain how to use trig identities to verify equations (using the words: identity, reciprocal, quotient ...)

For Test 4 - Thursday 11/ 14

Pg 237 #6-30 (multiples of 3 - skip #21), 41

Pg 200 #3, 5, 7, 13, 15, 19, 20, 25, 31, 35, 48

pg 190 #4 - 18 (even), 32, 36 - 48 (even)

Reciprocal Identities	Quotient Identities	Pythagorean Identities
$\sin(\theta) = \frac{1}{\csc(\theta)}$ $\csc(\theta) = \frac{1}{\sin(\theta)}$ $\cos(\theta) = \frac{1}{\sec(\theta)}$ $\sec(\theta) = \frac{1}{\cos(\theta)}$ $\tan(\theta) = \frac{1}{\cot(\theta)}$ $\cot(\theta) = \frac{1}{\tan(\theta)}$	$\cot(\theta) = \frac{\cos(\theta)}{\sin(\theta)}$ $\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$	$\sin^2(\theta) + \cos^2(\theta) = 1$ $1 + \cot^2(\theta) = \csc^2(\theta)$ $\tan^2(\theta) + 1 = \sec^2(\theta)$

Reciprocal Identities

$\sin(\theta) = \frac{1}{\csc(\theta)}$ $\csc(\theta) = \frac{1}{\sin(\theta)}$

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

$\tan(\theta) = \frac{1}{\cot(\theta)}$ $\cot(\theta) = \frac{1}{\tan(\theta)}$

Quotient Identities

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

$\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$

Pythagorean Identities

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

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

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

show:
$\sin x + \cos x(\cot x) = \csc x$

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

$\boxed{\cot(\theta) = \frac{\cos(\theta)}{\sin(\theta)}}$

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

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

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

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

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

$\boxed{\sin^2(\theta) + \cos^2(\theta) = 1}$

$$\frac{1}{\sin x} = \csc x$$

$\boxed{\csc(\theta) = \frac{1}{\sin(\theta)}}$

$$\csc x = \csc x$$

✓

Reciprocal Identities

$\sin(\theta) = \frac{1}{\csc(\theta)}$ $\csc(\theta) = \frac{1}{\sin(\theta)}$

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

$\tan(\theta) = \frac{1}{\cot(\theta)}$ $\cot(\theta) = \frac{1}{\tan(\theta)}$

Quotient Identities

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

$\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$

Pythagorean Identities

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

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

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

show:
$\sin^2\alpha - \cos^2\alpha = 2\sin^2\alpha - 1$

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

$\boxed{\sin^2(\theta) + \cos^2(\theta) = 1}$

$$\sin^2\alpha - \cos^2\alpha = 2\sin^2\alpha - (\sin^2\alpha + \cos^2\alpha)$$

$$\sin^2\alpha - \cos^2\alpha = 2\sin^2\alpha - \sin^2\alpha - \cos^2\alpha$$

$$\sin^2\alpha - \cos^2\alpha = \sin^2\alpha - \cos^2\alpha$$

✓

$$2x - x - y$$
$$= x - y$$

Reciprocal Identities

$\sin(\theta) = \frac{1}{\csc(\theta)}$ $\csc(\theta) = \frac{1}{\sin(\theta)}$

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

$\tan(\theta) = \frac{1}{\cot(\theta)}$ $\cot(\theta) = \frac{1}{\tan(\theta)}$

Quotient Identities

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

$\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$

Pythagorean Identities

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

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

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

show:
$\cot^2 x + \cot^4 x = \csc^4 x - \csc^2 x$

$$\cot^2 x + \cot^4 x = \csc^4 x - \csc^2 x$$

$x^2 + x^4$
$x^2(1 + x^2)$

$$\cot^2 x(1 + \cot^2 x) = \csc^4 x - \csc^2 x$$

$\boxed{1 + \cot^2(\theta) = \csc^2(\theta)}$

$$\cot^2 x(\csc^2 x) = \csc^4 x - \csc^2 x$$

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

$\boxed{1 + \cot^2(\theta) = \csc^2(\theta)}$

$$\cot^2 x(\csc^2 x) = \csc^2 x(1 + \cot^2 x - 1)$$

$$\cot^2 x(\csc^2 x) = \csc^2 x(\cot^2 x)$$

✓

Reciprocal Identities

$\sin(\theta) = \frac{1}{\csc(\theta)}$ $\csc(\theta) = \frac{1}{\sin(\theta)}$

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

$\tan(\theta) = \frac{1}{\cot(\theta)}$ $\cot(\theta) = \frac{1}{\tan(\theta)}$

Quotient Identities

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

$\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$

Pythagorean Identities

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

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

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

show:
$\cot^2 x + \cot^4 x = \csc^4 x - \csc^2 x$

$$\cot^2 x + \cot^4 x = \csc^4 x - \csc^2 x$$

$x^4 - x^2$
$x^2(x^2 - 1)$

$$\cot^2 x + \cot^4 x = \csc^2 x(\csc^2 x - 1)$$

$\boxed{1 + \cot^2(\theta) = \csc^2(\theta)}$

$$\cot^2 x + \cot^4 x = (1 + \cot^2 x)((1 + \cot^2 x) - 1)$$

$$\cot^2 x + \cot^4 x = (1 + \cot^2 x)(\cot^2 x) \leftarrow (1 + \cot^2 x)(1 + \cot^2 x - 1)$$

$$\cot^2 x + \cot^4 x = \cot^2 x + \cot^4 x$$

✓