11.1 Basic Identities and Trig Algebra NOTES

Write your questions here!

Reciprocal Identities

Quotient Identities

Simplify to a single Trig Expression

Ex 1:

Ex 2:

Ex 3: Verify the Identity

Start with the more complicated side and transform it into the other side using basic identities, algebra or other established identities.

Ex 4: Verify the Identity

Tips for Verifying Identities

Ex 5: Verify the Identity

Ex 6: Verify the Identity

ex 7: Prove Using Trig Identities

ex 8: Prove Using Trig Identities

TRIG FUN WITH ALGEBRA – MULTIPLY!

TRIG FUN WITH ALGEBRA – FACTOR!

Now, ummarize our notes here!

SUMMARY:

11.1 Basic Identities and Trig Algebra

PRACTICE

Directions: Simplify to a single trig expression.

1) $\sin\beta \sec\beta$

2) $\tan\theta \csc\theta \cos\theta$

3) $\dfrac{\tan\alpha \cot\alpha}{\csc\alpha}$

Directions: Verify the identity.

4) $\cos\theta \tan\theta \csc\theta = 1$

5) $\cot x \sin x = \cos x$

6) $\cot\mu \sec\mu \sin\mu = 1$

7) $\dfrac{1+\sec\theta}{\tan\theta} = \cot\theta + \csc\theta$

8) $\dfrac{\cot\theta}{\cos\theta} = \csc x$

9) $\dfrac{\frac{1}{\csc x}}{\frac{1}{\cot x}} = \cos x$

10) $\cot\mu\,(1+\sin\mu)=\cot\mu+\cos\mu$

11) $\tan x+\sec x=\frac{\sin x+1}{\cos x}$

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

13) $\tan\theta\left(\frac{cos^2\,\theta+1}{\sin\theta}\right)=\cos\theta+\sec\theta$

14) $\csc x+1=\sec x(\cot x+\cos x)$

Directions: Multiply.

15) $\cot x(\sin x+\sec x)$

16) $(\csc\alpha-\sec\alpha)(\cos\alpha+\sin\alpha)$

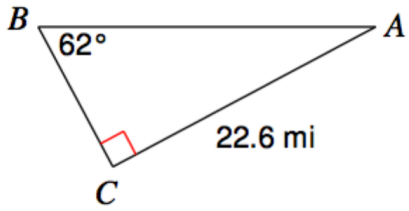
17) $(\cos x-\sin x)(\cos x+\sin x)$

Directions: Factor.

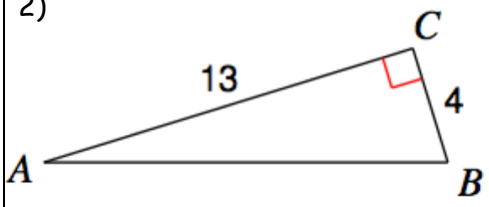
18) $cot^2x - 3cotx$	19) $2csc^2x - 5cscx - 12$	20) $tan^2x - sec^2x$

Review Skillz: Solve each triangle. (find all sides and angles).

1)



2)



11.1 Application and Extension

1) Simplify to a single trig expression.

$$\frac{\csc x \sin x}{\tan x}$$

2) Verify the identity.

$$\frac{\csc\theta + \tan\theta}{\sec\theta} = \cot\theta + \sin\theta$$

3) We know that $\tan x = \frac{\sin x}{\cos x}$ because its one of our Quotient Identities. In your graphing calculator in y_1 plug in $\tan x$. In y_2 plug in $\frac{\sin x}{\cos x}$.

a) What do you notice about the graphs?

b) Compare the table of values. What do you notice about them?

4) For any Trig Identity the graphs will be the same and the table of values will be equal. Plug the following in your calculator and determine which ARE trig identities.

a) $\sin(-x) = \sin x$ b) $\sin(-x) = -\sin x$ c) $\cos(-x) = \cos x$ d) $\cos(-x) = -\cos x$

e) $\tan(-x) = \tan x$ f) $\tan(-x) = -\tan x$ g) $tan^2x + 1 = sec^2x$ h) $cot^2x - 1 = csc^2x$

5) For each equation try the following values $\left(x = 0, \pi, \frac{\pi}{2}, \frac{\pi}{4}, \frac{\pi}{6}\right)$ and calculate both the left and right sides of the equation. If the equation is an identity, VERIFY IT! If it is not an identity, find a value of x for which both sides are defined but not equal.

a) $\tan x + 1 = \sec x(\cos x - \sin x)$ b) $\tan x - 1 = \sec x(\sin x - \cos x)$