SIMPLIFYING TRIG IDENTITIES - DAY 2

Memorize the following!

I. Reciprocal Identities

A) $\sin\theta = \frac{1}{\csc\theta}$ D) $\csc\theta = \frac{1}{\sin\theta}$

B) $\cos\theta = \frac{1}{\sec\theta}$ E) $\sec\theta = \frac{1}{\cos\theta}$

C) $\tan\theta = \frac{1}{\cot\theta}$ F) $\cot\theta = \frac{1}{\tan\theta}$

II. Quotient Identities

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

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

III. Pythagorean Identities

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

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

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

Use your strategies to simplify each expression.

1. $\csc^2\theta - 1$

Is this a Pythagorean Identity?

2. $(1-\sin x)(1+\sin x)$

FOIL IT!

3. $\sin^2\theta(\csc^2\theta - 1)$

Is there a P.I here?

4. $\cos\theta\tan\theta\csc\theta$

Rewrite in terms of sin and cos

5. $\dfrac{\csc\theta}{1+\cot^2\theta}$

Is there an identity?
Can we then write in terms of sin and cos?

6. $\dfrac{1}{\sin^2\theta}-\dfrac{1}{\tan^2\theta}$

Can you rewrite tan?

7. $\sin^2 x+\sin^2 x\cot^2 x$ Is there a GCF?

8. Using trigonometric identities find the values of the other four trigonometric functions given the values of two of the trigonometric functions.

A. $\sin\theta=\dfrac{5}{6}$ and $\cos\theta=\dfrac{-\sqrt{11}}{6}$

B. $\cos\theta=\dfrac{4}{9}$ and $\sin\theta=\dfrac{-\sqrt{5}}{3}$

Name _____ Date _____ Pd _____

Trig Identities Puzzle

Directions: Simplify each trig expression. Show all work.
Find your answer at the bottom of the page. Write the letter associated with your answer in the box that contains the question number. You may use answers more than once.

1. $\csc \theta \tan \theta$

2. $\sin \theta + \cot \theta \cos \theta$

3. $\csc^2 \theta - \cot^2 \theta$

4. $\sec^2 \theta - \cos^2 \theta \sec^2 \theta$

5. $\sin^2 \theta + \cos^2 \theta + \tan^2 \theta$

6. $\cos \theta (1 + \tan^2 \theta)$

7. $\sin \theta \csc \theta - \cos^2 \theta$

8. $\sec \theta - \sin \theta \tan \theta$

9. $(\csc \theta + 1)(\csc \theta - 1)$

10. $\dfrac{\sin \theta}{\cos \theta \tan \theta}$

11. $(\csc \theta + \cot \theta)(1 - \cos \theta)$

12. $(\tan^2 \theta - \sec^2 \theta)(\sin^2 \theta + \cos^2 \theta)$

E. $\sec \theta$	N. $\csc \theta$	S. 1	X. -1	R. $\cos \theta$
H. $\tan^2 \theta$	O. $\sin^2 \theta$	T. $\cot^2 \theta$	U. $\sin \theta$	I. $\sec^2 \theta$

On October 4, 2006 Akira Haraguchi broke his own record by reciting the number pi to 100,000 decimal places.
It took him over

3	5	12	9	1	6	2		4	7	11	8	10

to complete the task.

Name _____ Date _____

Trig Identities Puzzle

Directions: Simplify each trig expression. Show all work.
Find your answer at the bottom of the page. Write the letter associated with your answer in the box that contains the question number. You may use answers more than once.

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

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

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

4. $\sec^2\theta - \cos^2\theta \sec^2\theta$
$\sec^2\theta (\sec^2\theta - \cos^2\theta)$
$\sec^2\theta (\sin^2\theta) = \frac{1}{\cos^2\theta} \cdot \sin^2\theta$
$= \tan^2\theta$

5. $\sin^2\theta + \cos^2\theta + \tan^2\theta$
$1 + \tan^2\theta$
$\sec^2\theta$

6. $\cos\theta (1 + \tan^2\theta)$
$\cos\theta (\sec^2\theta) = \cos\theta \left(\frac{1}{\cos^2\theta}\right)$
$= \frac{1}{\cos\theta} = \sec\theta$

7. $\sin\theta \csc\theta - \cos^2\theta$
$\sin\theta \left(\frac{1}{\sin\theta}\right) - \cos^2\theta =$
$1 - \cos^2\theta =$
$\sin^2\theta$

8. $\sec\theta - \sin\theta \tan\theta$
$\sec\theta - \frac{\sin^2\theta}{\cos\theta} = \frac{1}{\cos\theta} - \frac{\sin^2\theta}{\cos\theta}$
$= \frac{\cos^2\theta}{\cos\theta} = \cos\theta$

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

10. $\frac{\sin\theta}{\cos\theta \tan\theta} = \frac{\tan\theta}{\tan\theta} = 1$

11. $(\csc\theta + \cot\theta)(1 - \cos\theta)$
$\csc\theta + \csc\theta\cos\theta - \cot\theta - \cot\theta\cos\theta$
$\frac{1}{\sin\theta} + \frac{\cos\theta}{\sin\theta} - \frac{\cos\theta}{\sin\theta} = \frac{\cos^2\theta}{\sin\theta} = \frac{1 - \cos^2}{\sin\theta}$
$\sin\theta$

12. $(\tan^2\theta - \sec^2\theta)(\sin^2\theta + \cos^2\theta)$
$-1 (1) = -1$

E. $\sec\theta$	N. $\csc\theta$	S. 1	X. -1	R. $\cos\theta$
H. $\tan^2\theta$	O. $\sin^2\theta$	T. $\cot^2\theta$	U. $\sin\theta$	I. $\sec^2\theta$

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S	I	X	T	E	E	N		H	O	U	R	S
3	5	12	9	1	6	2		4	7	11	8	10

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