

BE - Alg 2 | Monday 2/14/2011

① Find the determinant:  $\begin{vmatrix} 1 & -5 \\ 3 & 4 \end{vmatrix}$

② Find the discriminant:  $8x^2 + 10x = 3$

③ If #2 can be factored, solve the equation by factoring.

①  $\begin{vmatrix} 1 & -5 \\ 3 & 4 \end{vmatrix} = (1 \cdot 4) - (-5 \cdot 3) = 4 - (-15) = \boxed{19}$

②  $8x^2 + 10x - 3 = 0$

$a = 8$

$b^2 - 4ac$

$b = 10$

$(10)^2 - 4(8)(-3)$

$c = -3$

$100 + 96 = 196 = d$

Perfect Square  
 $14^2 = 196 \therefore$  the quadratic is factorable

Sum  $\Rightarrow 10$   
prod  $\Rightarrow -24$

4 & 6 won't work!

$-2 + 12$

$(8x^2 + 12x) + (2x - 3) = 0$

$4x(2x + 3) + 1(2x + 3) = 0$

$\therefore (2x + 3)(4x - 1) = 0 \quad \boxed{x = -\frac{3}{2}, \frac{1}{4}}$

# Alg. 2 - Practice Simplifying Trig. Identities

$$2(\csc^2\theta - \cot^2\theta)$$

MR. C<sup>12</sup> way

Since  $\sin^2\theta + \cos^2\theta = 1$

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

ONE of the  
3 Pythagorean  
Identities

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

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

SUBSTITUTE

$$2(\csc^2\theta - \cot^2\theta)$$

$$2(\csc^2\theta - [\csc^2\theta - 1])$$

$$2(\csc^2\theta - \csc^2\theta + 1)$$

$$2(1) = \boxed{2}$$

ANOTHER way

$$2(\csc^2\theta - \cot^2\theta)$$

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

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

Since they  
HAVE A  
COMMON  
denominator

$$2\left(\frac{\sin^2\theta}{\sin^2\theta}\right)$$

Since from  
 $\sin^2\theta + \cos^2\theta = 1$

$$2(1) = \boxed{2}$$

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

## COMPARISON

I decided to attack the  $\cot^2\theta$  first.

First, change both terms inside parentheses to sines and cosines. This is a method I like and usually prefer to use.

# PRACTICE Simplifying Trigonometric Identities

Memorize  $\Rightarrow$  These Lead to:

$$\boxed{\sin \theta = \frac{1}{\csc \theta}} \Rightarrow \csc \theta = \frac{1}{\sin \theta}$$

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

$$\boxed{\tan \theta = \frac{1}{\cot \theta}} \Rightarrow \cot \theta = \frac{1}{\tan \theta}$$

$$\boxed{\frac{\sin \theta}{\cos \theta} = \tan \theta} \Rightarrow \cot \theta = \frac{\cos \theta}{\sin \theta}$$

$$\star \boxed{\sin^2 \theta + \cos^2 \theta = 1} \Rightarrow 1 + \cot^2 \theta = \csc^2 \theta$$

AND  $\tan^2 \theta + 1 = \sec^2 \theta$

Pg 780 # 30-36  $\Rightarrow$

$$3(\tan^2 \theta - \sec^2 \theta)$$

ANS

-3

$$\frac{\cos \theta \csc \theta}{\tan \theta}$$

$\cot^2 \theta$

$$\frac{\sin \theta \csc \theta}{\cot \theta}$$

$\tan \theta$

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

ANS

1

$$\frac{1 - \sin^2 \theta}{\sin^2 \theta}$$

cot<sup>2</sup> θ

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

csc<sup>2</sup> θ

$$\frac{\tan^2 \theta - \sin^2 \theta}{\tan^2 \theta \sin^2 \theta}$$

1

Homework: Pg 860 # 13-18