

BE - Alg 2 | Monday 2/8/2010

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

② $8x^2 + 10x - 3 = 0$

$a = 8$

$b^2 - 4ac$

$b = 10$

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

$c = -3$

$100 + 96 = \boxed{196 = d}$

Perfect Square
 $\downarrow$
 $14^2 = 196 \therefore$ 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's 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

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

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

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

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

Tony's 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

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

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

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

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

COMPARISON

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

Tonya changed both terms inside parentheses to sines and cosines. This is a method I like and usually prefer to use.

PRACTICE Simplifying Trigonometric Identities

Memorize

→ These Lead to:

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

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

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

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

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

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

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

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

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

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

$$\text{AND} \tan^2 \theta + 1 = \sec^2 \theta$$

Pg 780 # 30-36 ⇒

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

ANS

$$-3$$

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

$$\cot^2 \theta$$

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

$$\tan \theta$$

ANS

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

1

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

cot² θ

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

csc² θ

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

1

Homework: Pg 860 #13-18