BE - Alg 2 | Monday 2/13/2012

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.

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

$4 - (-15) = \boxed{19}$

② $8x^2 + 10x - 3 = 0$

$b^2 - 4ac$

$a = 8$

$b = 10$

$c = -3$

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

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

Perfect Square

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

Sum $\Rightarrow 10$
Prod $\Rightarrow -24$

$-2, +12$

4 & 6 won't work!

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

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

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

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

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

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

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

Since from $\sin^2\theta + \cos^2\theta = 1$, $\sin^2\theta = \boxed{1-\cos^2\theta}$

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 $\Longrightarrow$ These Lead to:

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

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

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

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

* $\sin^2\theta + \cos^2\theta = 1 \Rightarrow 1 + \cot^2\theta = \csc^2\theta$

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

Pg 780 #1 30–36 $\Rightarrow$

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

$\frac{\cos\theta \csc\theta}{\tan\theta}$ $\cot^2\theta$

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

ANS

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

1

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

$\cot^2\theta$

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

$\csc^2\theta$

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

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Homework: Pg 860 #13-18