Quiz 9 **Algebra & Trig** **11/24/03**

Each problem is worth 5 points. For full credit indicate clearly how you reached your answer.

1. Find exact values for all solutions (in radians) to the equation $2\cos x + 1 = 0$.

$2\cos x = -1$

$\cos x = -1/2$

$\cos^{-1}(\cos x) = \cos^{-1}(-1/2)$

$x = \cos^{-1}(-1/2)$

so

$x = \frac{2\pi}{3} + 2\pi n$ for any integer n

or

$x = \frac{4\pi}{3} + 2\pi n$ for any integer n

$2\pi - \frac{2\pi}{3} = \frac{4\pi}{3}$

2. Verify the trig identity $\cot^2\theta - \cos^2\theta = \cot^2\theta \cos^2\theta$.

I'll work with the left-hand side:

$$\cot^2\theta - \cos^2\theta =$$

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

$$\frac{\cos^2\theta - \cos^2\theta \cdot \sin^2\theta}{\sin^2\theta} =$$

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

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

$$\cot^2\theta \cdot \cos^2\theta = \cot^2\theta \cdot \cos^2\theta \quad \checkmark$$