ALEKS® Test 3 (Fall 2012) #1

PreCalculus / Mat146 FALL 2012*** (Prof. Porter)

Student Name/ID:

1. Prove the identity.

$$\left(1-\cos^2 x\right)\cot x = \sin x \cos x$$

2. Complete the proof of the identity by choosing the Rule that justifies each step.

$$\left(1-\sin^2 x\right)\csc x$$
$$= \cos^2 x \csc x$$
$$= \cos^2 x \left(\frac{1}{\sin x}\right)$$
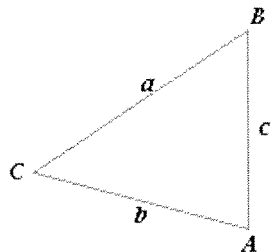$$= \cos x \left(\frac{\cos x}{\sin x}\right)$$
$$= \cos x \cot x$$

3. Find the amplitude, period, and phase shift of the function.

$$y = 2 + 2\cos\left(\pi x + \frac{\pi}{3}\right)$$

Give the exact values, not decimal approximations.

4. Consider a triangle ABC like the one below. Suppose that $B = 25°$, $C = 106°$, and $a = 7$. (The figure is not drawn to scale.) Solve the triangle.

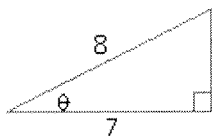Round your answers to the nearest tenth.

5.
Let θ be an angle in quadrant III such that $\tan \theta = \dfrac{7}{2}$.

Find the exact values of $\cos \theta$ and $\csc \theta$.
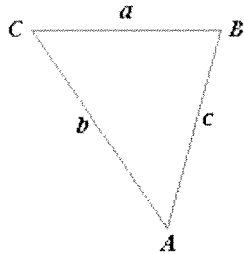
6. Find $\tan \theta$, $\cos \theta$, and $\csc \theta$, where θ is the angle shown in the figure.

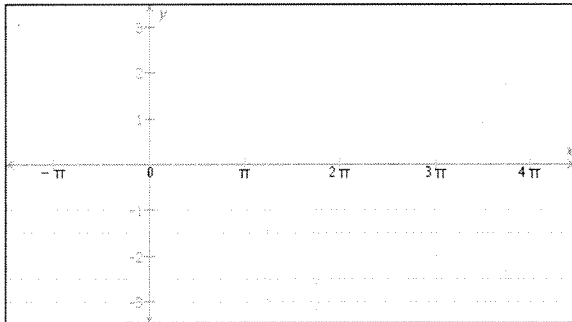Give exact values, not decimal approximations.

7. Consider a triangle ABC like the one below. Suppose that $a = 61$, $b = 51$, and $c = 27$. (The figure is not drawn to scale.) Solve the triangle.

Carry your intermediate computations to at least four decimal places, and round your answers to the nearest tenth.

8.
Graph the function $y = \dfrac{3}{2} \cos\left(\dfrac{2}{3} x - \dfrac{\pi}{3}\right)$.
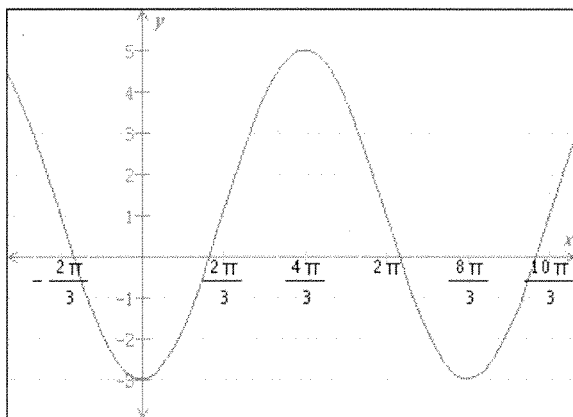

9. Find all solutions of the equation in the interval $[0, 2\pi)$.

$$\cos\theta - 1 = -1$$

Write your answer in radians in terms of π.
If there is more than one solution, separate them with commas.

10. Write the equation of a sine or cosine function to describe the graph.

11.
Find the exact value of $\sin^{-1}\left(-\dfrac{1}{2}\right)$.

Write your answer in radians in terms of π .

12. Determine the quadrant in which the terminal side of θ lies.

(a) $\sin \theta < 0$ and $\tan \theta > 0$	
quadrant {I, II, III, IV}	
(b) $\sin \theta < 0$ and $\cos \theta < 0$	
quadrant {I, II, III, IV}	