ALEKS® Test 3 (Fall 2012) #3

PreCalculus / Mat146 ***FALL 2013*** (Prof. Porter)

Student Name/ID:

1. Prove the identity.

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

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

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

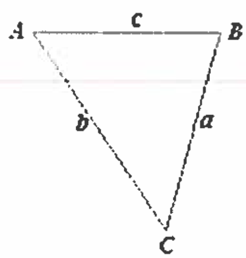
3. Find the amplitude, period, and phase shift of the function.

$$y=-2+2\cos\left(3x-\frac{\pi}{4}\right)$$

Give the exact values, not decimal approximations.

4. Consider a triangle ABC like the one below. Suppose that $A = 53°$, $C = 82°$, and $b = 18$. (Th
figure is not drawn to scale.) Solve the triangle.

Round your answers to the nearest tenth.



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

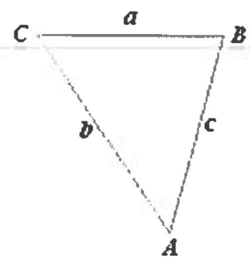
Find the exact values of $\cos\theta$ and $\csc\theta$.

6. Find $\cot\theta$, $\csc\theta$, and $\sin\theta$, where θ is the angle shown in the figure.

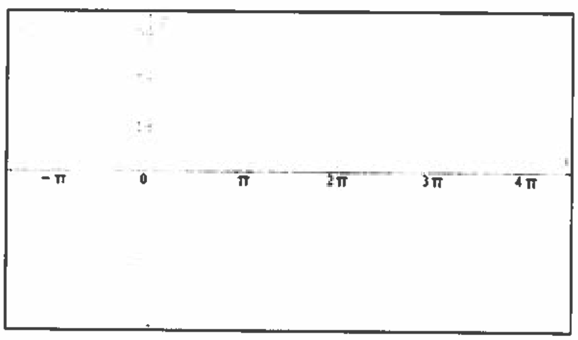
Give exact values, not decimal approximations.

7. Consider a triangle ABC like the one below. Suppose that $a=34$, $b=47$, and $c=23$. (The f[illegible] 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 $y=2\cos\left(\frac{2}{3}x-\frac{\pi}{2}\right)$.

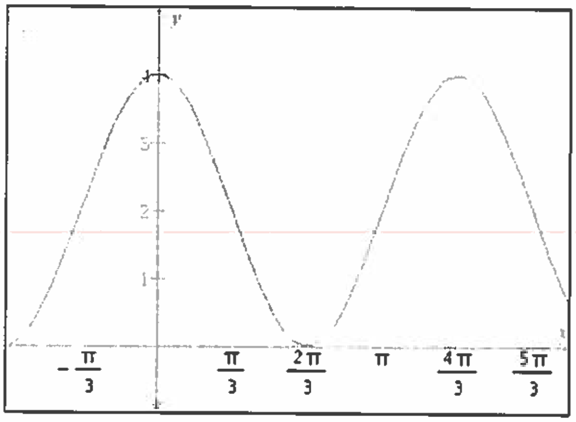


9. Find all solutions of the equation in the interval $[0, 2\pi)$.

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

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 $\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$.

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