NC Math 3 Honors - Unit 7B Circles and Trigonometry Review

1. On your test, you will be given a partially completed unit circle. (Not just the 1st quadrant.) You will need to fill in all missing information (angle measures in degrees and radians and ordered pairs).

2. Fill in any missing values in the table below:

x	$\sin x$	$\cos x$	$\tan x$	$\sec x$	$\csc x$	$\cot x$
$\frac{10\pi}{3}$						
-135^0						
$-\frac{3\pi}{2}$						
330^0						

3. Identify the period, amplitude, and frequency of each of the following:

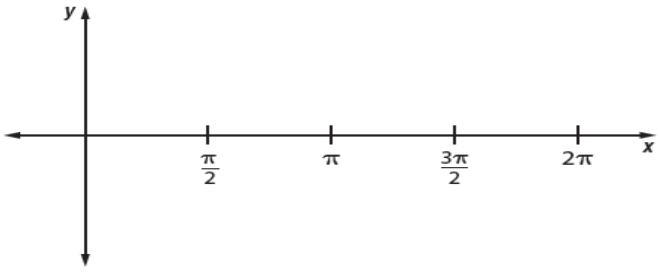
a. $y = -4\sin(2x)$

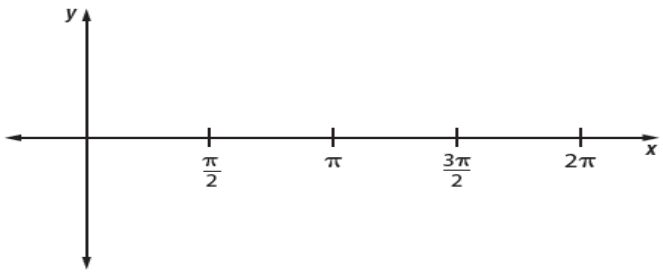
b. $y = 2cos\left(\frac{x}{3}\right)$

4. Identify the period and amplitude of each of the following. Then graph the function.

a. $y = -\frac{1}{2}\cos(2x) - 4$

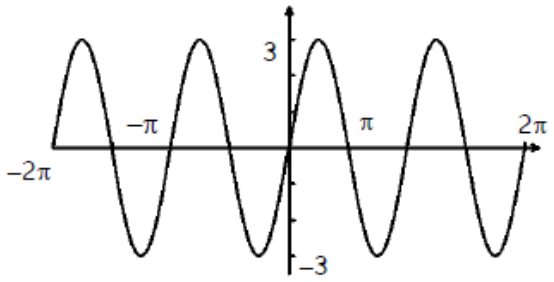
b. $y = 3\sin x + 5$





5. Write an equation for each of the following graphs.

A.



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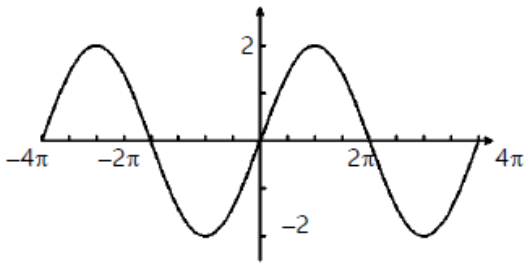
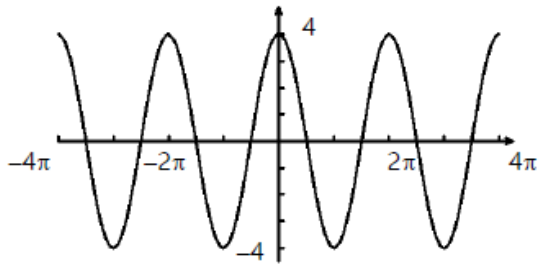
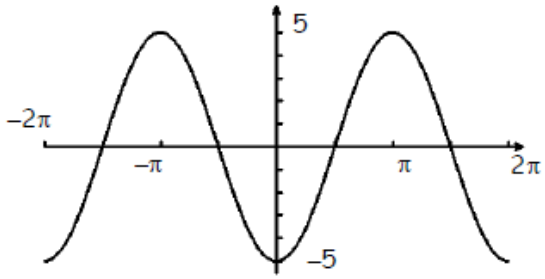


C.



D.



6. Find the length of an arc with central angle 315^0 and radius 11 feet.

7. Find the length of an arc with central angle $\frac{3\pi}{2}$ and radius 16 feet.

8. Find the area of a sector with central angle $\frac{17\pi}{12}$ and diameter 28 yards.

9. Find the area of a circle with central angle 150^0 and corresponding sector area 24π.

10. You have probably noticed that when you ride a Ferris Wheel, the distance from the ground varies sinusoidally with time. When the last seat is filled and the Ferris wheel starts, your seat is at the position in the figure below. Let *t* be the number of seconds that have elapsed since the Ferris wheel started. You find that it takes you four seconds to reach the top, 43 feet above the ground, and that the wheel makes a revolution every eight seconds. The diameter of the wheel is 40 feet.

a) Write an equation to model this situation.

b) Identify the period of the function and the amplitude.

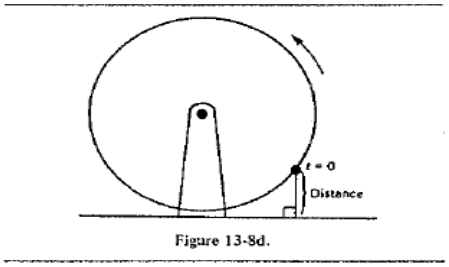


Figure 13-8d.

c) Predict the height above the ground when: $t = 6$, $t = 9$, and $t = 0$.

12. BA buoy bobbing up and down in the water as waves passes, it moves from its highest point to its lowest point, and back to its highest point every 10 seconds. The distance between the highest and lowest points is three feet.

a) Determine the amplitude and period of sinusoidal function that models the bobbing buoy.

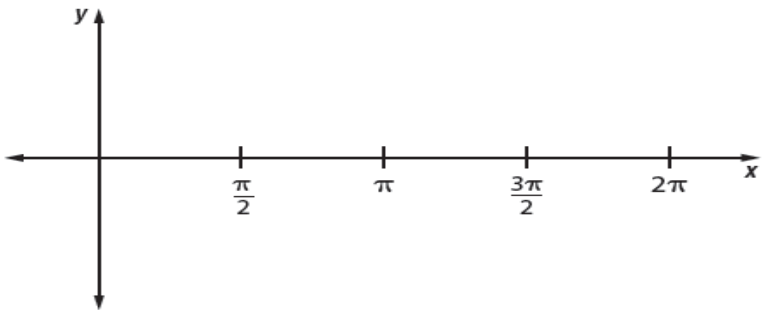
b) Write an equation of a sinusoidal function that models the bobbing buoy, using x = 0 as its highest point.

c) Find the height of the buoy after 15 seconds.

13. A function rule in the form $y = a\ cos(bx)$ has period π and the distance between the highest and lowest point is 24.

a) Find *a* and *b*.

b) Graph the function in Part a. Mark the scale on the y-axis.



c) Change one number in the above function rule so the period is 2π. Write the new rule.

d) Sketch the new graph.