Math-3A Name_____ ID: 1

SM3-A HW#10-9 (Applications of sinusoids)

Date_____ Period____

Using degrees, find the centerline, amplitude, period, and phase shift (left/right) of each function. Hint: separate the HSF from the left/right shift by factoring out the coefficient of θ

1) $y = 4\sin\frac{\theta}{4}$

2) $y = 6\cos 4\theta$

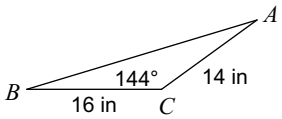
Using radians, find the centerline, amplitude, period, and phase shift (left/right shift) of each function.

3) $y = 6\cos\frac{\theta}{7}$

4) $y = 3\sin 6\theta$

Find the area of each triangle to the nearest tenth.

5)

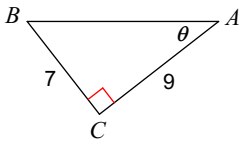


Find each measurement indicated. Round your answers to the nearest tenth.

6) $m\angle B = 74°$, $a = 33$ yd, $b = 17$ yd
Find $m\angle C$

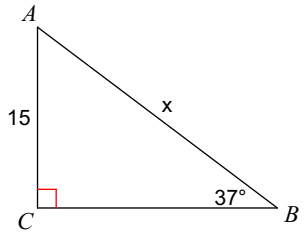
Find the measure of each angle indicated. Round to the nearest tenth.

7)



Find the measure of each side indicated. Round to the nearest tenth.

8)



Solve each equation.

9) $\log_5(x+3) - \log_5 x = 2$

10) $\log_5 10 + \log_5 3x = 3$

11) Find the equation that predicts the height of a weight that is suspended from a spring given the following conditions: a) Initial displacement from equilibrium: 2 inches, (b) completes one cycle in 10 seconds, (c) disregard left/right shift, (d) use radians

12) Find the equation that predicts the height of a weight that is suspended from a spring given the following conditions: a) Initial displacement from equilibrium: 4 inches, (b) completes one cycle in 12 seconds, (c) disregard left/right shift, (d) use degrees

13) Find the equation that predicts the height of a weight that is suspended from a spring given the following conditions: a) Initial displacement from equilibrium: 4.7 inches, (b) completes 50 cycles per minute (careful: this is a frequency not a period), (c) disregard left/right shift, (d) use degrees, (e) have the input value be time in seconds

14) Find the equation that predicts the height of a weight that is suspended from a spring given the following conditions: a) Initial displacement from equilibrium: 9.7 inches, (b) completes 5 cycles per second (careful: this is a frequency not a period), (c) disregard left/right shift, (d) use radians, (e) have the input value be time in seconds

15) A Ferris wheel has a diameter of 444 feet. The bottom of the Ferris Wheel is 3 feet off the ground. Once all of the cars (it's a big Ferris Wheel) are loaded it takes 80 seconds to complete one revolution. (This is a period!). Write an equation that predicts the height of the bottom of a car as a function of time. Disregard any left/right shift of the sine function. Use radians to determine 'b'.
$h(t) = a\sin(b \cdot \theta) + k$

16) A Ferris wheel has a diameter of 26 meters. The bottom of the Ferris Wheel is 1 meter off the ground. Once all of the chairs are loaded it takes 12 seconds to complete one revolution. (This is a period!). Write an equation that predicts the height of the bottom of a chair as a function of time. Disregard any left/right shift of the sine function. Use degrees to determine 'b'.
$h(t) = a\sin(b \cdot \theta) + k$