SM3 HW#6-8 (Applications of sinusoids)

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) $y = \sin(8\theta - 300)$

2) $y = \frac{1}{3} \cdot \cos\left(\frac{\theta}{8} + 30\right)$

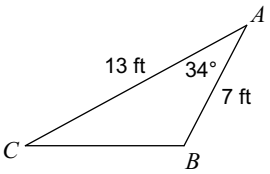
Using radians, find the centerline, amplitude, period, and phase shift (left/right shift) of each function.

3) $y = \frac{1}{3} \cdot \cos\left(5\theta + \frac{3\pi}{4}\right)$

4) $y = 3\cos\left(\frac{\theta}{8} + \frac{\pi}{3}\right)$

Find the area of each triangle to the nearest tenth.

5)

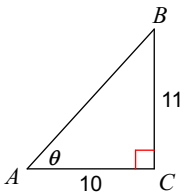


Find each measurement indicated. Round your answers to the nearest tenth.

6) $m\angle C = 151°$, $b = 13$ m, $c = 33$ m
Find $m\angle B$

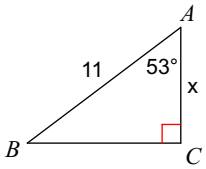
Find the measure of each angle indicated. Round to the nearest tenth.

7)



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

8)



9) 1 yd³ of soil containing 52% silt was mixed into 5 yd³ of soil containing 40% silt. What is the silt content of the mixture?

Solve each equation.

10) $\log_2(x^2 + 3) - \log_2 6 = 1$

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

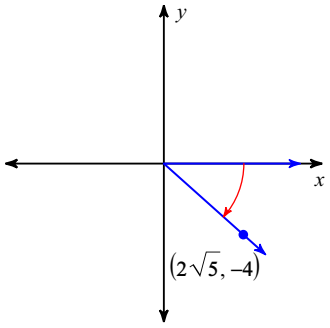
14) Find the equation that predicts the height of a weight that is suspended from a spring given the following conditions: a) Initial displacement from equilibrium: 9.7 inches, (b) completes 5 cycles per second (careful: this is a frequency not a period), (c) disregard left/right shift, (d) use radians, (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'.
$h(t) = a\sin(b \cdot \theta) + k$

Use the given point on the terminal side of angle θ to find the value of the trigonometric function indicated.

17) csc θ



18) sin θ