Pre-Calculus Name: Date: Period:

Unit 8 Practice Test #1
Learning Targets: 8A and 8B

Complete the problems below, show your work, and write your answer in the blank provided.

This is a non-calculator test!

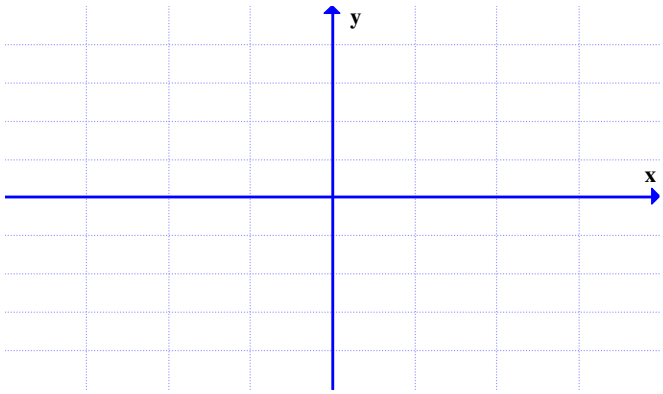
<u>Learning Target 8A</u>: I can graph and solve problems involving the sine and cosine functions, including their transformations.

1. Find the amplitude, period, and phase shift of $f(x) = -3\sin(2x - 9) + 3$.

2. Write an equation of the cosine function with amplitude 2 and period 4π.

3. Find the amplitude, period, phase shift, and vertical shift of $y = 3\sin(2x - \pi) + 2$.

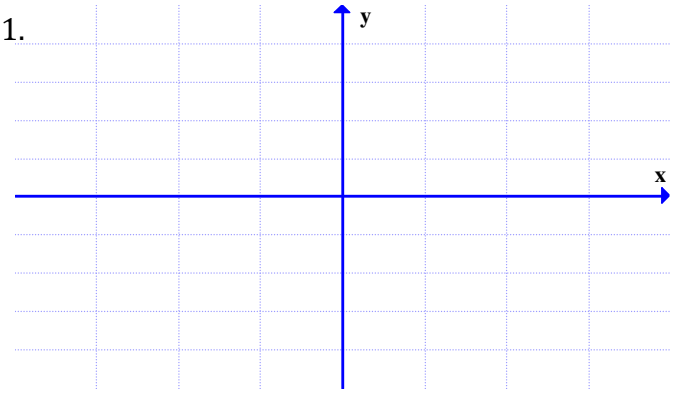
4. Graph two periods of $f(x) = -\sin(\frac{x}{3})$.



5. Graph two periods of $f(x) = 2\sin(x - \frac{\pi}{2}) + 1$.

   amp = _____

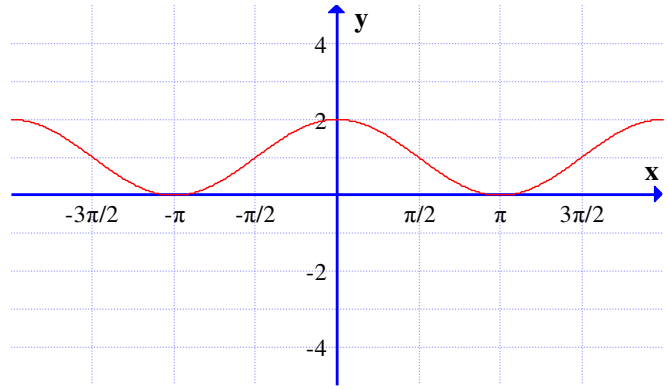
   per = _____



6. Consider the graph to the right.

a) Write a *cosine* function that would have the graph to the right.

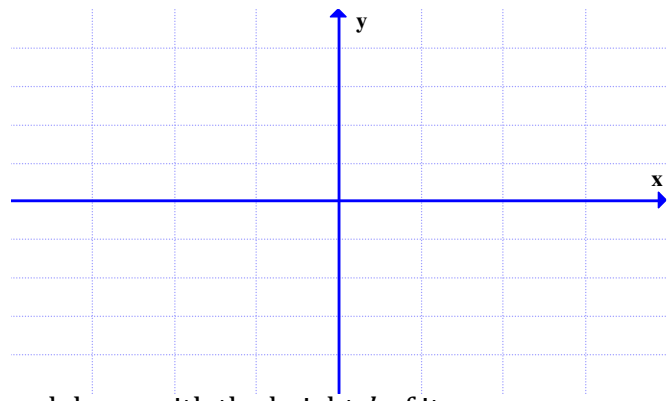
b) Write a *sine* function that would have the graph to the right.



7. Consider the function $g(x) = 3\sin\left(x - \frac{\pi}{2}\right) + 2$.

a) Describe the transformations of $y = \cos(x)$ to make this graph.

b) Graph $g(x)$ to the right.

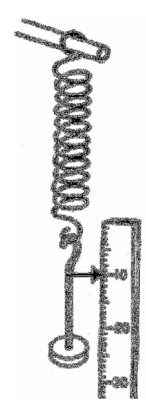


8. A signal buoy in the Chesapeake Bay bobs up and down with the height h of its transmitter (in feet) above sea level modeled by $h = a \sin bt + 5$. During a small squall its height varies from 1 ft to 9 ft and there are 3 sec from one 9-ft height to the next. What are the values of the constants a and b?

$a =$ _____

$b =$ _____

9. A spring is mounted on a stand with a weight attached to it. We collect data over at .01 sec. intervals and record the height h (in meters) at time t as the ordered pair (t, h). Write the sinusoidal function for the spring if:
Max (.4 , 2.0) Min (.6 , 0.2)



<u>Learning Target 8B</u>: I can graph and solve problems involving tangent, secant, cosecant, and cotangent functions, including their transformations.

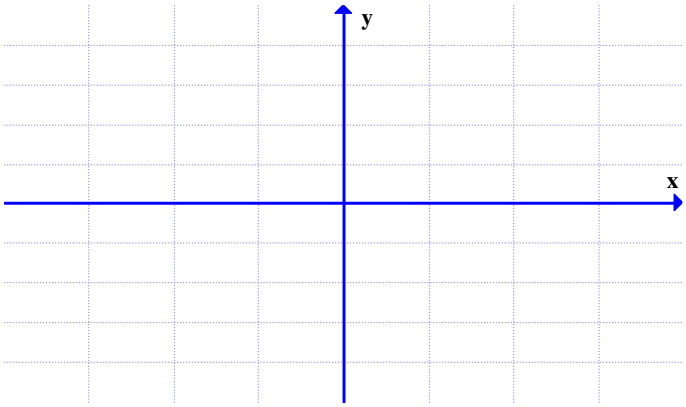
10. What are the two equations for finding the vertical asymptotes of a tangent function?

11. What changes in the tangent pattern when the amplitude is negative?

12. Find the vertical asymptotes of $y = 3\tan x$.

13. Write an equation of the tangent function with amplitude 2, vertical shift 1, and period 4.

14. Graph $y = \csc(x + \frac{\pi}{2})$.



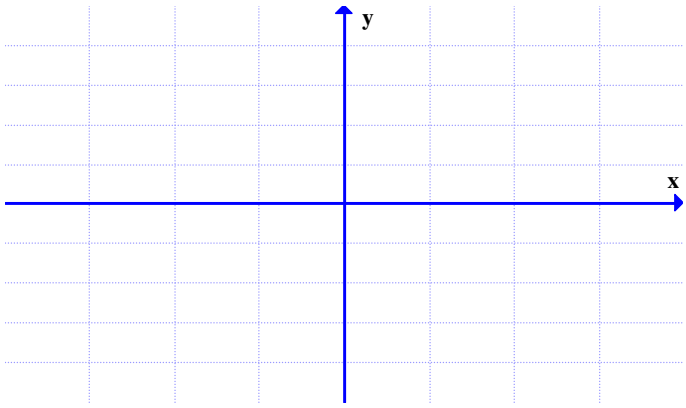
15. Consider the function $y = -\tan 4x$.

a) Find the period and asymptotes

per:_____

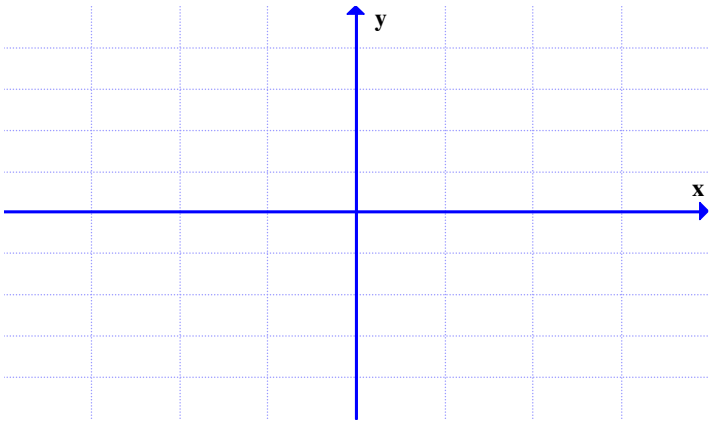
asymptotes: _____

b) Graph the function



16. Find the period of $y = \cot 2x$ and graph the function (Be sure to indicate your scales.)

per:_____



17. What other trigonometric function has the same set of asymptotes as the graph of $y = \cot x$? Explain your reasoning.

18. Explain the steps to write an equation for the graph to the right and write an equation.