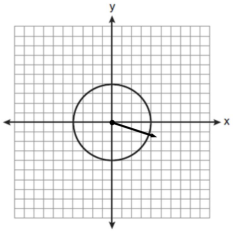
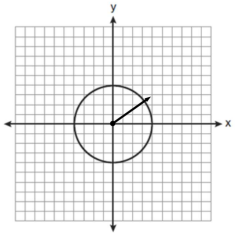
Name _____ Date _____

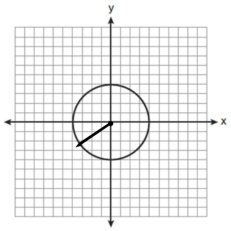
Mr. Schlansky Algebra II

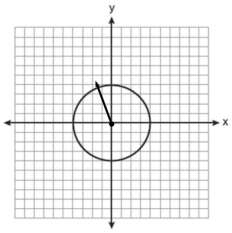
Trigonometry Review Sheet

1. Which of the following sketches would represent 6 radians?

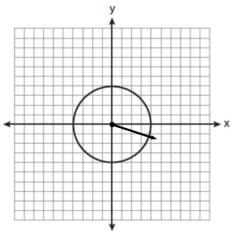
1) 

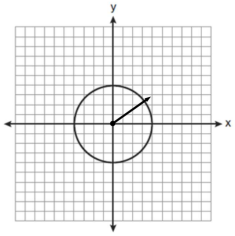
2) 

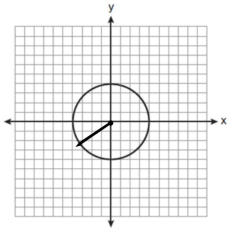
3) 

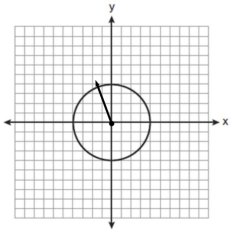
4) 

2. Which of the following sketches would represent 3.9 radians?

1) 

2) 

3) 

4) 

3. If θ passes through (-3,4), find:

a) $\cos\theta$ b) $\sin\theta$ c) $\tan\theta$

d) $\sec\theta$ e) $\csc\theta$ f) $\cot\theta$

4. If θ passes through (2,-7), $\sec\theta$ must be:

1) $\frac{\sqrt{53}}{7}$

2) $\frac{\sqrt{53}}{2}$

3) $-\frac{\sqrt{53}}{7}$

4) $-\frac{\sqrt{53}}{2}$

5. If $\sin\theta = \frac{5}{6}$ and θ is in Quadrant II, find:

a) $\cos\theta$ b) $\sin\theta$ c) $\tan\theta$

d) $\sec\theta$ e) $\csc\theta$ f) $\cot\theta$

6. If $\cos\theta = -\frac{3}{4}$ and θ is in Quadrant III, then $\sin\theta$ is equivalent to

1) $-\frac{\sqrt{7}}{4}$

2) $\frac{\sqrt{7}}{4}$

3) $-\frac{5}{4}$

4) $\frac{5}{4}$

7. A circle centered at the origin has a radius of 4 units. The terminal side of an angle, θ, intercepts the circle in Quadrant III at point *P*. The *x*-coordinate of point *P* is 2. Find all six trigonometric functions.

a) $\cos\theta$ b) $\sin\theta$ c) $\tan\theta$

d) $\sec\theta$ e) $\csc\theta$ f) $\cot\theta$

8. A circle centered at the origin has a radius of 10 units. The terminal side of an angle, θ, intercepts the circle in Quadrant II at point *C*. The *y*-coordinate of point *C* is 8. What is the value of $\cos\theta$?

1) $-\frac{3}{5}$

2) $-\frac{3}{4}$

3) $\frac{3}{5}$

4) $\frac{4}{5}$

9. What is the exact value of $\cos\left(\frac{5\pi}{6}\right)$?

1) $\frac{\sqrt{3}}{2}$

2) $\frac{1}{2}$

3) $-\frac{\sqrt{3}}{2}$

4) $-\frac{1}{2}$

10. What is the exact value of $\tan\left(\frac{3\pi}{4}\right)$?

1) $\frac{\sqrt{3}}{2}$

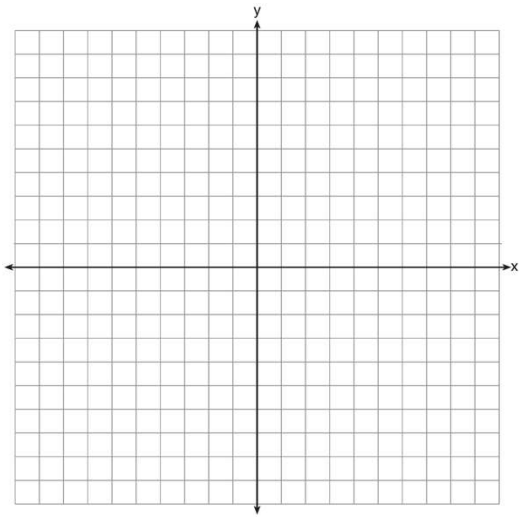
2) $\frac{\sqrt{2}}{2}$

3) $-\frac{\sqrt{3}}{2}$

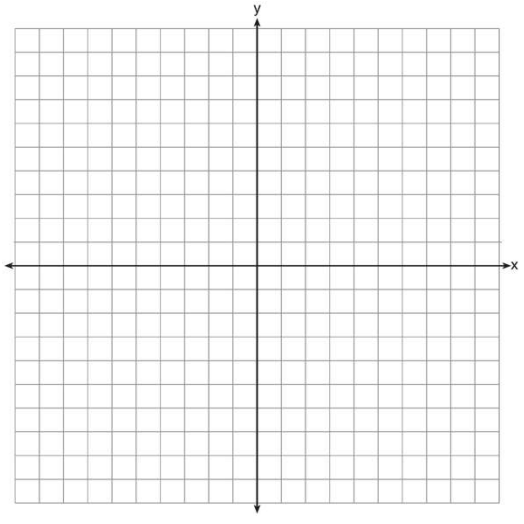
4) $-\frac{\sqrt{2}}{2}$

Graph one full cycle of the following sinusoidal functions:

11. $y = -3\cos 2x - 4$



12. $y = 4\sin \pi x - 3$



13. The depth of the water at a marker 20 feet from the shore in a bay is depicted in the graph below.

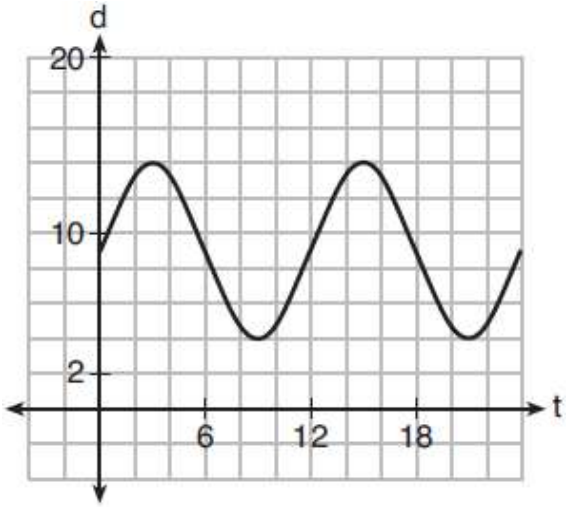
If the depth, d, is measured in feet and time, t, is measured in hours since midnight, what is an equation for the depth of the water at the marker?

1) $d = 5\cos\left(\frac{\pi}{6}t\right) + 9$

2) $d = 9\cos\left(\frac{\pi}{6}t\right) + 5$

3) $d = 9\sin\left(\frac{\pi}{6}t\right) + 5$

4) $d = 5\sin\left(\frac{\pi}{6}t\right) + 9$



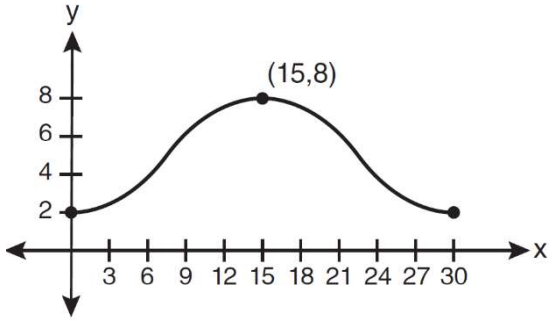
14. Which equation is graphed in the diagram below?

1) $y = 3\cos\left(\frac{\pi}{30}x\right) + 8$

2) $y = 3\cos\left(\frac{\pi}{15}x\right) + 5$

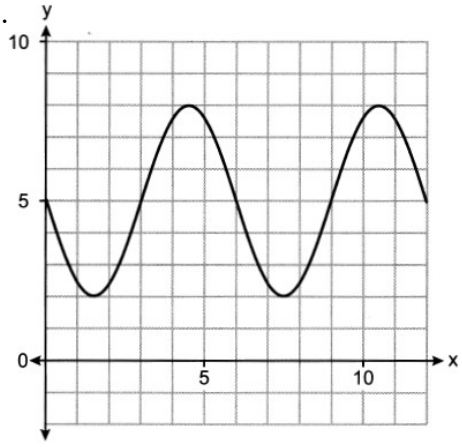
3) $y = -3\cos\left(\frac{\pi}{30}x\right) + 8$

4) $y = -3\cos\left(\frac{\pi}{15}x\right) + 5$

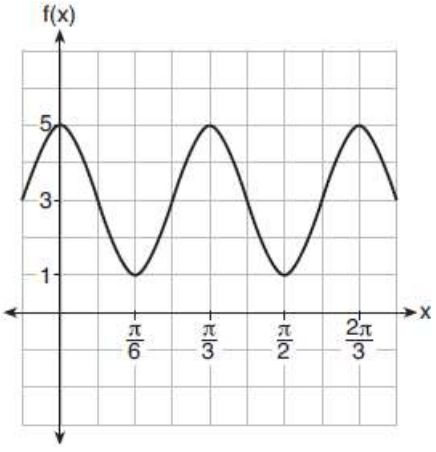


Write the equations of the sinusoidal functions given below.

15.



16.



17. A person's lung capacity can be modeled by the function $C(t) = 250\sin\left(\frac{2\pi}{5}t\right) + 2450$, where $C(t)$ represents the volume in mL present in the lungs after t seconds. State the maximum value of this function over one full cycle, and explain what this value represents.

18. The function $d(t) = 2\cos\left(\frac{\pi}{6}t\right) + 5$ models the water depth, in feet, at a location in a bay, t hours since the last high tide. Determine the *minimum* water depth of the location, in feet, and justify your answer.

19. As θ increases from $-\frac{\pi}{2}$ to 0 radians, the value of $\cos\theta$ will

1) decrease from 1 to 0
2) decrease from 0 to -1
3) increase from -1 to 0
4) increase from 0 to 1

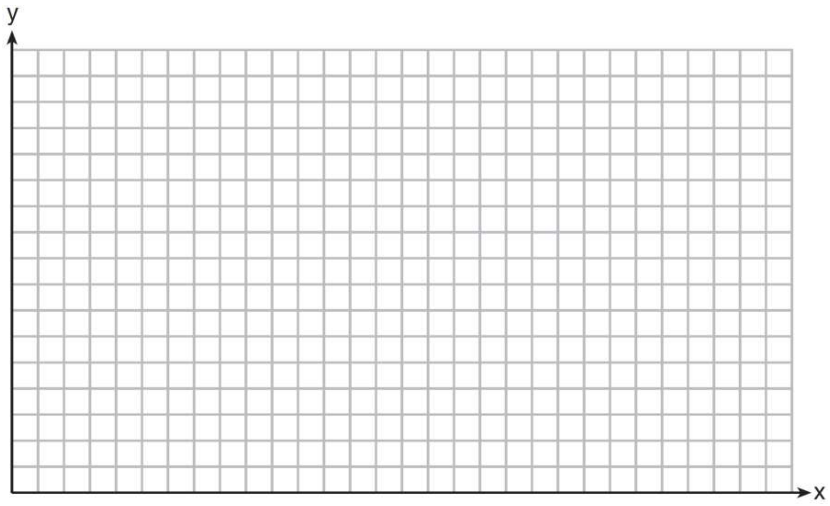
20. Given $p(\theta) = 3\sin\left(\frac{1}{2}\theta\right)$ on the interval $-\pi < \theta < \pi$, the function p

1) decreases, then increases
2) increases, then decreases
3) decreases throughout the interval
4) increases throughout the interval

21. The monthly high temperature (ºF) in Buffalo, New York can be modeled by $B(m) = 24.9\sin(0.5m - 2.05) + 55.25$, where m is the number of the month and January = 1. Find the average rate of change in the monthly high temperature between June and October, to the *nearest hundredth*.

22. The height, $h(t)$ in cm, of a piston, is given by the equation $h(t) = 12\cos\left(\frac{\pi}{3}t\right) + 8$, where t represents the number of seconds since the measurements began. Determine the average rate of change, in cm/sec, of the piston's height on the interval $1 \le t \le 2$.

23. The High Roller, a Ferris wheel in Las Vegas, Nevada, opened in March 2014. A passenger's height, in feet, above the ground after t minutes can be modeled by the equation $h(t) = -260\cos\left(\frac{\pi}{15}t\right) + 290$. Graph one full cycle of $h(t)$ on the axes provided. Identify the period and state its meaning in the context of the problem.



24. Griffin is riding his bike down the street in Churchville, N.Y. at a constant speed, when a nail gets caught in one of his tires. The height of the nail above the ground, in inches, can be represented by the trigonometric function $f(t) = -13\cos(0.8\pi t) + 13$, where t represents the time (in seconds) since the nail first became caught in the tire. Determine the period of $f(t)$. Interpret what the period represents in this context. On the grid below, graph *at least one* cycle of $f(t)$ that includes the y-intercept of the function.