

Quick Check – Math 3

Unit 6, Lesson 2

Name: _____

Directions: Be sure to show your work and/or explain your reasoning.

1. Use the relationships between circular revolutions, degrees, and radians to complete the following.

a. 1.25 revolutions = _____ degrees = _____ radians

b. $\frac{7\pi}{6}$ radians = _____ degrees = _____ revolutions

c. 480 degrees = _____ revolutions = _____ radians

d. $\frac{17\pi}{6}$ radians = _____ degrees = _____ revolutions

2. Demonstrate how you can determine the value of $\cos 210^\circ$ without using technology.

3. The Ferris wheel on Navy Pier in Chicago has 40 equally spaced gondolas and a 70-foot radius. Passengers load the Ferris wheel from a platform above the ground. After loading the passengers, the Ferris wheel moves in a counterclockwise direction. The center of the Ferris wheel is 75 feet off the ground.

a. There are spokes connecting each gondola to the center of the wheel. What is the measure of the angle formed by adjacent spokes that connect each gondola to the center of the wheel if the angle is measured in degrees? In radians? Show your work.

Angle measure in degrees: _____

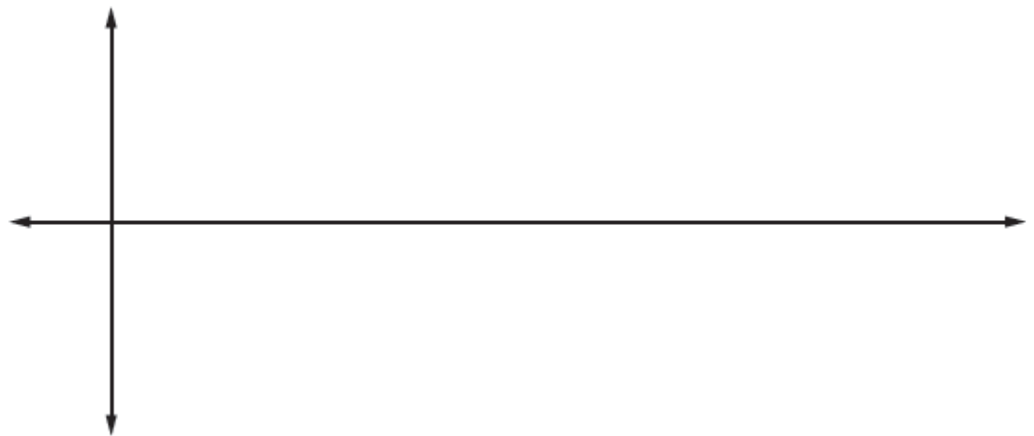
Angle measure in radians: _____

b. Sydney begins in a gondola at the "3 o'clock" position of the Ferris wheel. How far must she rotate to reach the lowest position on the Ferris wheel? Give your answer in degrees and radians.

Degrees: _____

Radians: _____

c. Make a sketch showing Sydney's position relative to the ground as the wheel makes one complete revolution. Label the x -axis of your sketch using radians or degrees. Label the y -axis using feet.



d. If x is the amount of rotation of Sydney's gondola in radian measure, write a function rule that models Sydney's position relative to the ground.

e. The wheel takes 3 minutes to make a complete revolution. Find Sydney's distance above the ground after she has been rotating for 1 minute. Show your work or explain your reasoning

4. The minute hand on a clock is five inches long and is pointing directly at the 2.

a. How far is the end of the minute hand above the horizontal line through the center of the clock?

b. How far is the end of the minute hand from the vertical line through the center of the clock?

5. Without using technology, explain why each of the following statements is true.

a. $\cos \frac{\pi}{6} = \cos \frac{13\pi}{6}$

b. $\sin 25^\circ = \sin 155^\circ$

6. Suppose that the height in feet of a Ferris wheel seat changes in a pattern that can be modeled by the function $h(t) = 30 \sin t + 5$, where t is time in minutes since the wheel started turning.

a. What is the radius of the Ferris wheel?

b. Determine the maximum height of a seat on this Ferris wheel. Show your work.

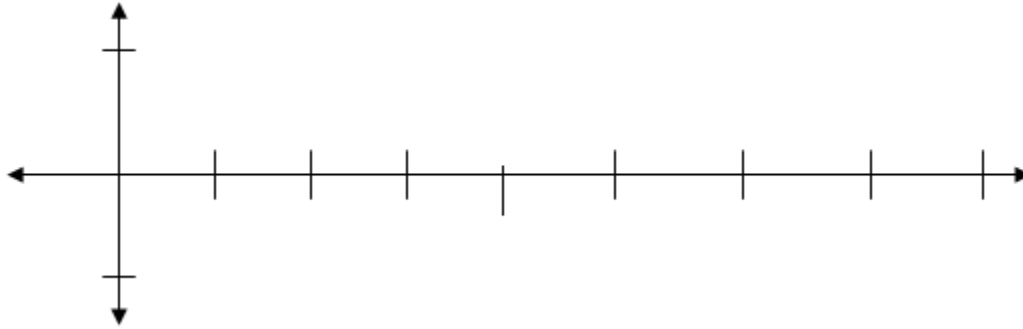
c. If the Ferris wheel is operating without stopping, how long will it take a seat to move from the highest point on the wheel all the way around the circle and back to the highest point?

7. An equation in the form $y = A \sin Bx$ has period 360° and Amplitude 4.

a. Find A and B. Explain your reasoning.

A = _____ B = _____

b. Graph the function in Part a. Explain how you can see from the graph that the period is 360° and the amplitude is 4.



c. Change on numbe in the above equation so the period is 180° . Write the new equation and sketch the resulting graph.

