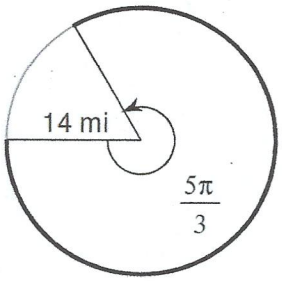
Advanced Functions – 8.1 Part II WS: Apps with Angle Measure Name: Key (answers only)

Directions: Use the Arc Length Formula: $s = r \cdot \theta$ or the Sector Area Formula: $A = \frac{1}{2} \cdot r^2 \cdot \theta$ for the problems below. Round to nearest tenth and include units. Show your work!!

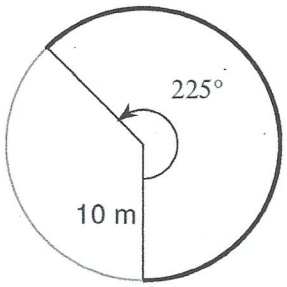
1.)



a.) Arc Length: 73.3 mi

b.) Sector Area: 513.1 mi^2

2.)



a.) Arc Length: 39.3 m

b.) Sector Area: 196.3 m^2

3.) Find the central angle θ (in degrees) if the arc length is 18 cm and the diameter is 6 cm.

$\theta = 343.8°$

4.) If the sector area is 126.7 ft^2 and the central angle θ is 120°, find the length of the radius.

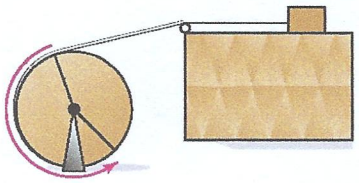
$r = 11 ft$

5.) Pittsburgh, PA and Miami, FL lie approximately on the same meridian. Pittsburg has a latitude of 40.5° N and Miami has a latitude of 25.5° N. The radius of the earth is approximately 3,960 miles. What is the distance between the two cities?

$S = 1036.7 mi$

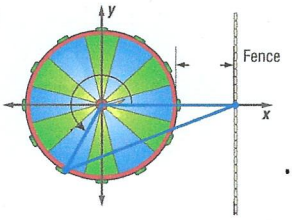
6.) A wheel is connected to a box by a cable. What is the radius of the wheel if the box moved 7.8 feet with a 135° angle counter-clockwise?

$r = 3.3 ft$

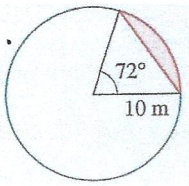


7.) Anthony's little brother gets on a carousel that is 8 meters in diameter. As the start of the ride, his brother is 3 meters from the ride entrance in the fence. How far will his brother be from the entrance after the carousel rotates $\frac{7\pi}{6}$?

$X = 10.7 m$



8.) Using the figure below, find the following:



a.) Find perimeter of shaded region.

24.4 m

b.) Find area of the shaded region.

15.2 m^2

9.) Suppose the gondolas on the Navy Pier Ferris wheel were numbered from 1 through 40 consecutively in a counterclockwise fashion. If you were sitting in gondola number 3 and the wheel were to rotate counterclockwise through $\frac{47\pi}{10}$, which gondola used to be in the position that you are in now?

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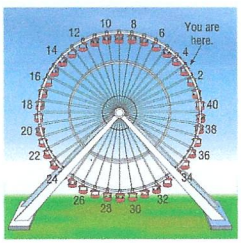

10.) The figure below shows a highway sign that warns of a railroad crossing. The lines (who have an arc length of 1.5 inches) that form the cross pass through the circle's center and intersect at right angles. If the radius of the circle is 24 in, find the arc length of the entire railroad crossing sign.

156.8 in