

4.3

Arc Length and Circular
Motion Homework

Name _____

Date _____ Period _____

Problems 1 – 4, Use the arc length formula $s = r\theta$ to find the missing quantity. Round answers to three decimal places.

1. $r = 5$ miles, $s = 3$ miles, $\theta = ?$

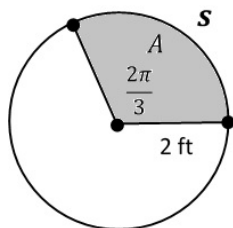
2. $s = 6$ feet $\theta = \frac{1}{2}$ radian, $r = ?$

3. $r = 3$ inches, $\theta = 120^\circ$ $s = ?$

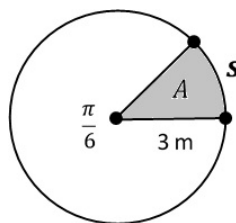
4. $s = 2$ m, $\theta = \frac{1}{3}$ radian, $r = ?$

Problems 5 – 6, Find the length s and area A . Round answers to three decimal places.

5.



6.



Problems 7 – 13, Solve.

7. A strawberry farmer needs to water a strawberry patch of 1500 square yards that is in the shape of a sector of a circle with a radius of 40 yards. Through what angle should the sprinkler rotate?

8. The minute hand of a clock is 6 inches long. How far does the tip of the minute hand move in 15 minutes?

9. A water mill grinds corn to make cornmeal. The water wheel has a radius of 18 feet. The wheel is rotating at 8 revolutions per minute. Find the linear speed, in feet per minute, of the water.

10. A car's wheel with a radius of 1.5 feet is spinning at a rate of 20 revolutions per minute. How fast is the car traveling?

11. Jacksonville, Florida is due south of Charleston, West Virginia. Find the distance between the two cities if Charleston is located at $38^{\circ}21'$ North latitude and Jacksonville is $30^{\circ}20'$ North latitude. Assume that the radius of the Earth is 3960 miles.

12. It takes twelve identical pieces to form a circular track for a pair of toy electric race cars. If the inside arc of each piece is 3.2 inches shorter than the outside arc, what is the width of the track?

13. A car that has a wheel radius of 1.5 feet travels 30 miles in 45 minutes. How fast are the wheels spinning? Give your answer in revolutions per minute.