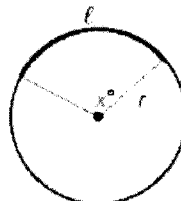
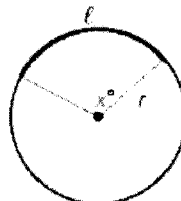
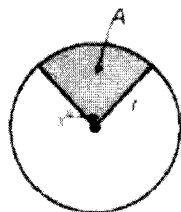
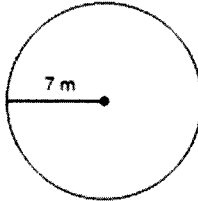


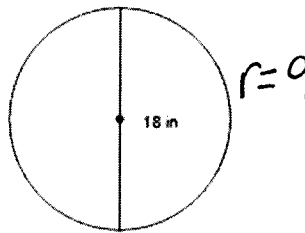
Master Eq

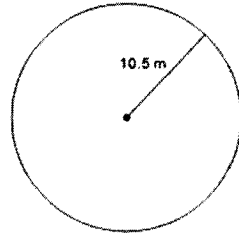
10-2 & 11-3 Arc Length, Areas of Circles and Sectors

Circular Term	Definition	Diagram	Formula
Arc Length (l)	The distance between the endpoints along an arc measured in linear units. It is a portion of the circle, so its length is a fraction of the circumference.		$l = \frac{x}{360} \cdot 2\pi r$
Area (A)	The number of square units that fill up a circle		$A = \pi r^2$
Sector	The region bounded by an inscribed angle and its intercepted arc. It is a portion of the circle, so its area is a fraction of the area of the circle. The ratio of the area A of a sector to the area of the whole circle, πr^2 , is equal to the ratio of the degree measure of the intercepted arc x to 360.		Proportion: $\frac{A}{\pi r^2} = \frac{x}{360}$ Equation: $A = \frac{x}{360} \cdot \pi r^2$

1-3: Find the circumference and area of each circle in pi form and also rounded to the nearest hundredth.

1.  $c = \frac{14\pi}{1} = 43.98 \text{ m}$
 $A = \frac{49\pi}{1} = 153.94 \text{ m}^2$

2.  $c = \frac{18\pi}{1} = 56.55 \text{ in}$
 $A = \frac{81\pi}{1} = 254.47 \text{ in}^2$

3.  $c = \frac{21\pi}{1} = 65.97 \text{ m}$
 $A = \frac{110.25\pi}{1} = 346.36 \text{ m}^2$

4-7: Find the indicated measure. Round to the nearest hundredth.

4. The area of a circle is 132.7 square centimeters. Find the diameter.

$$A = \pi r^2 \quad r^2 = \frac{132.7}{\pi} \quad r = \sqrt{\frac{132.7}{\pi}} = 6.499 \dots d = 2r = 12.998$$

$d = 13.00 \text{ cm}$

5. Find the area of a circle with a circumference of 28π millimeters.

$$2\pi r = 28\pi \quad r = \frac{28\pi}{2\pi} = 14$$

$$A = \pi r^2 = \pi (14)^2 = 196\pi \approx 615.75 \text{ mm}^2$$

6. The area of a circle is 706.9 square inches. Find the radius.

$$A = \pi r^2 \quad r^2 = \frac{706.9}{\pi} \quad r = \sqrt{\frac{706.9}{\pi}} \approx 15.00 \text{ in}$$

7. Find the circumference of a circle with an area of 2827.4 square feet.

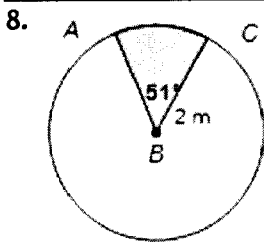
$$2827.4 = \pi r^2 \quad r^2 = \frac{2827.4}{\pi} \quad r = \sqrt{\frac{2827.4}{\pi}} \approx 29.999 \approx 30.0$$

$$C = 2\pi r = 2\pi(30) = 60\pi \approx 188.50 \text{ ft.}$$

$$l = \frac{x}{360} \cdot 2\pi r$$

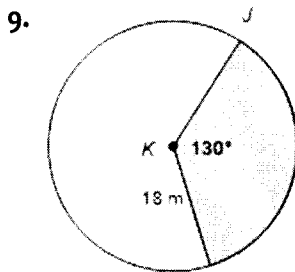
$$A = \frac{x}{360} \cdot \pi r^2$$

8-10: Find the arc length and the area of each shaded sector. Round to the nearest tenth.



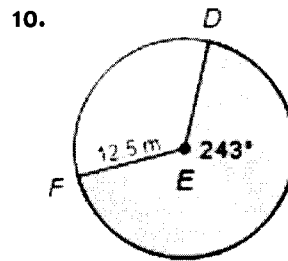
$$l = \frac{51}{360} \cdot 4\pi = 1.78 \text{ m}$$

$$A = \frac{51}{360} \cdot 4\pi = 1.78 \text{ m}^2$$



$$l = \frac{130}{360} \cdot 36\pi = 40.84 \text{ m}$$

$$A = \frac{130}{360} \cdot 324\pi = 367.57 \text{ m}^2$$



$$l = \frac{243}{360} \cdot 25\pi = 53.01 \text{ m}$$

$$A = \frac{243}{360} \cdot 156.25\pi = 331.34 \text{ m}^2$$

11-12: Real-world Application problems.

11. Lucy has to buy a new wheel for her bike. The bike wheel has a diameter of 20 inches.

- a. If Lucy rolls the wheel one complete rotation along the ground, how far will the wheel travel? Round your answer to the nearest hundredth of an inch.



$$C = 20\pi = 62.83 \text{ in}$$

- b. If the bike wheel is rolled along the ground so that it rotates 45° , how far will the wheel travel? Round your answer to the nearest hundredth of an inch.



$$\frac{45}{360} \cdot 20\pi = 7.85 \text{ in}$$

- c. If the bike wheel is rolled along the ground for 10 inches, through what angle does the wheel rotate? Round your answer to the nearest tenth of a degree.



$$\frac{x}{360} \cdot 20\pi = 10$$

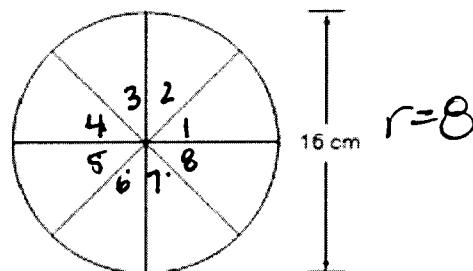
$$x \cdot 20\pi = 3600$$

$$x = \frac{3600}{20\pi} = 57.30^\circ \approx 57.3^\circ$$

12. Jason wants to make a spinner for a new board game he invented. The spinner is a circle divided into 8 congruent pieces. What is the area of each piece to the nearest tenth?

$$\frac{360}{8} = \angle \text{ of each piece} = 45^\circ$$

$$A = \frac{45}{360} \cdot 64\pi = 25.13 \text{ cm}^2$$



You could also take the area of 64π & divide it by 8, which also equals the same answer!