

Lesson 13.1:

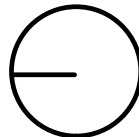
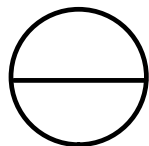
Circles and Circumference

Key Idea

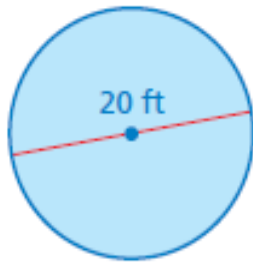
Radius and Diameter

Words The diameter d of a circle is twice the radius r . The radius r of a circle is one-half the diameter d .

Algebra Diameter: $d = 2r$ Radius: $r = \frac{d}{2}$

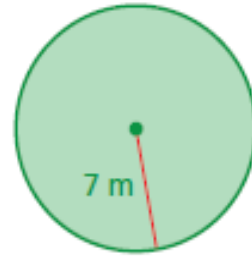


a. The diameter of a circle is 20 feet. Find the radius.



$$r = 10 \text{ ft}$$

b. The radius of a circle is 7 meters. Find the diameter.



$$d = 14 \text{ m}$$

* units *

1. The diameter of a circle is 16 centimeters. Find the radius.

$$r = 8 \text{ cm}$$

2. The radius of a circle is 9 yards. Find the diameter.

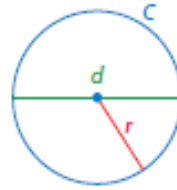
$$d = 18 \text{ yd}$$

Key Idea

Circumference of a Circle

Words The circumference C of a circle is equal to π times the diameter d or π times twice the radius r .

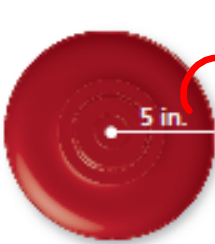
Algebra $C = \pi d$ or $C = 2\pi r$



$$\pi = 3.14 \text{ or } \frac{22}{7}$$

only when r or d
is a multiple of 7

a. Find the circumference of the flying disc. Use 3.14 for π .



$$\begin{aligned} C &= 2\pi r \\ &= 2 \cdot 3.14 \cdot 5 \text{ in} \\ &= 3.14 \cdot 10 \text{ in} \end{aligned}$$

$$\boxed{31.4 \text{ in}}$$

b. Find the circumference of the watch face. Use $\frac{22}{7}$ for π .



$$\begin{aligned} C &= \pi d \\ &= \frac{22}{7} \cdot 28 \text{ mm} \end{aligned}$$

$$\boxed{88 \text{ mm}}$$

Find the circumference of the object. Use 3.14 or $\frac{22}{7}$ for π .

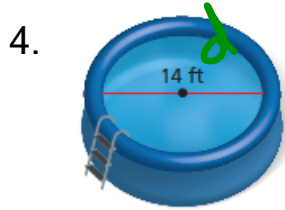


$$2\pi r$$

$$2 \cdot 3.14 \cdot 2 \text{ cm}$$

$$3.14 \cdot 4 \text{ cm}$$

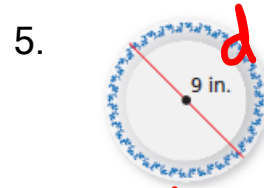
12.56 cm



$$\pi d$$

$$\frac{22}{7} \cdot 14 \text{ ft}$$

44 ft



$$\pi d$$

$$3.14 \cdot 9 \text{ in}$$

28.26 in

The circumference of the roll of caution tape decreases 10.5 inches after a construction worker uses some of the tape. Which is the best estimate of the diameter of the roll after the decrease?

- (A) 5 inches (B) 7 inches (C) 10 inches (D) 12 inches



$$C - 10.5 = 31.4 - 10.5 \approx 21$$

↓

$$\text{New } C = \pi d$$

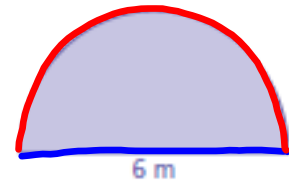
$$21 = 3d$$

$$7 = d$$

$\pi \approx 3$

A semicircle is one-half of a circle. Find the perimeter of the semicircular region.

The straight side is 6 meters long. The distance around the curved part is one-half the circumference of a circle with a diameter of 6 meters.



$$\frac{1}{2}\pi d + d$$

$$\frac{1}{2} \cdot 3.14 \cdot 6m + 6m$$

$$3.14 \cdot 3m + 6m$$

$$9.42m + 6m = \boxed{15.42m}$$

Find the perimeter of the semicircular region

7.



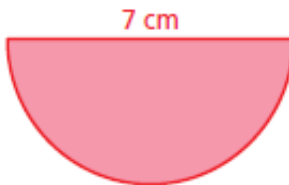
$$\frac{1}{2}\pi d + d$$

$$\frac{1}{2} \cdot 3.14 \cdot 2ft + 2ft$$

$$3.14ft + 2ft$$

$$\boxed{5.14ft}$$

8.



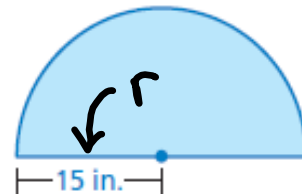
$$\frac{1}{2}\pi d + d$$

$$\frac{1}{2} \cdot \frac{22}{7} \cdot 7cm + 7cm$$

$$11cm + 7cm$$

$$\boxed{18cm}$$

9.



$$\frac{1}{2} \cdot 2\pi r + 2r$$

$$3.14 \cdot 15in + 2(15in)$$

$$47.1in + 30in$$

$$\boxed{77.1in}$$