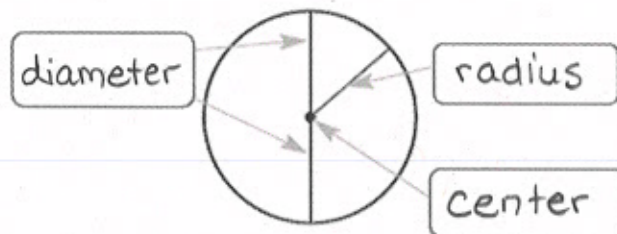


A **circle** is the set of all points in a plane that are the same distance from a point called the **center**. The **circumference** is the distance around a circle. The **diameter** is the distance across a circle through its center. The **radius** is the distance from the center to any point on the circle.

Fill in each box with one of the following terms: *center*, *diameter*, and *radius*.



Radius and Diameter

Words The diameter, d , of a circle is twice its radius, r . The radius, r , of a circle is half of its diameter, d .

Symbols

$$d = 2r$$

$$r = \frac{d}{2}$$

Example 1: The diameter of a circle is 14 inches. Find the radius.



$$r = \frac{d}{2}$$

Radius of circle formula.

$$r = \frac{14}{2}$$

Substitute d with 14.

$$r = 7$$

Divide.

The radius is 7 inches.

Example 2: The radius of a circle is 8 feet. Find the diameter.



$$d = 2r$$

Diameter of circle formula.

$$d = 2 \cdot 8$$

Substitute r with 8.

$$d = 16$$

Multiply.

The diameter is 16 feet.

Try These: Find the radius or diameter of each circle with the given dimensions.

a. $d = 23 \text{ cm}$
 $r = ?$

$$r = \frac{d}{2}$$

$$r = \frac{23}{2}$$

$$r = 11.5 \text{ cm}$$

b. $r = 3 \text{ in.}$
 $d = ?$

$$d = 2r$$

$$d = 2(3)$$

$$d = 6 \text{ in}$$

c. $d = 16 \text{ yd}$
 $r = ?$

$$r = \frac{d}{2}$$

$$r = \frac{16}{2}$$

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

d. $r = 5.2 \text{ m}$
 $d = ?$

$$d = 2r$$

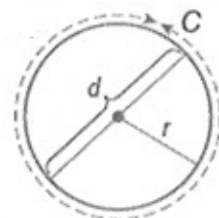
$$d = 2(5.2)$$

$$d = 10.4 \text{ m}$$

Circumference

Words The circumference of a circle is equal to π times its diameter or π times twice its radius.

Model



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

- * Use the π button on the calculator when solving problems involving π .
- * When rounding, use the " \approx " (approximately equal to) symbol.
- * In Terms of pi (π): When asked to leave an answer in terms of pi, it simply means to give the answer (with the label) before multiplying by π .

Example 3: Find the circumference of a circle with a radius of 21 inches. State your answer in terms of π and to the nearest hundredth.

$$C = 2\pi r$$

Circumference of a circle.

$$C = 2 \cdot \pi \cdot 21$$

Substitute r with 21.

$$C = 42 \cdot \pi$$

Multiply 2 and 21.

$$C = 42\pi \text{ in}$$

Answer in terms of π .

$$C \approx 131.946$$

Multiply π button by 42.

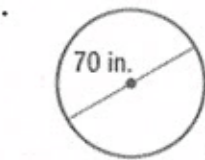
$$C \approx 131.95$$

Round to nearest hundredth.

The circumference of the circle is about 131.95 inches.

Try These: Find the circumference of each circle. State your answer in terms of π and to the nearest hundredth.

e.



$$d = 70 \text{ in}$$

$$C = \pi d$$

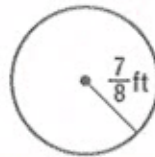
$$C = \pi(70)$$

$$C = 70\pi \text{ in}$$

$$C \approx 219.911$$

$$C \approx 219.91 \text{ in}$$

f.



$$r = \frac{7}{8}$$

$$C = 2\pi r$$

$$C = 2\pi\left(\frac{7}{8}\right)$$

$$C = 1\frac{3}{4}\pi \text{ ft}$$

$$C \approx 5.497$$

$$C \approx 5.50 \text{ ft}$$

$$\begin{aligned} &= \frac{2 \cdot 7}{8} \\ &= \frac{14}{8} \\ &= 1\frac{6}{8} + 2 \\ &= 1\frac{3}{4} \end{aligned}$$

Example 4: Big Ben is a famous clock tower in London, England. The diameter of the clock face is 23 feet. Find the circumference of the clock face. State your answer in terms of π and to the nearest hundredth.



$C = \pi d$	Circumference of a circle.
$C = \pi \cdot 23$	Substitute d with 23.
$C = 23\pi \text{ feet}$	Answer is terms of π .
$C \approx 72.256$	Multiply.
$C \approx 72.26$	Round to the nearest hundredth.

The circumference of the clock face is about 72.26 feet.

Try This:

g. A circular fence is being placed to surround a tree. The diameter of the fenced area is 4 feet. How much fencing is used? Round to the nearest hundredth.



$$C = \pi d$$

$$C = \pi(4)$$

$$C \approx 12.566$$

$$C \approx 12.57 \text{ ft}$$

The amount of fencing used is about 12.57 ft.

