Circumference

Lesson 8-1

Vocabulary:

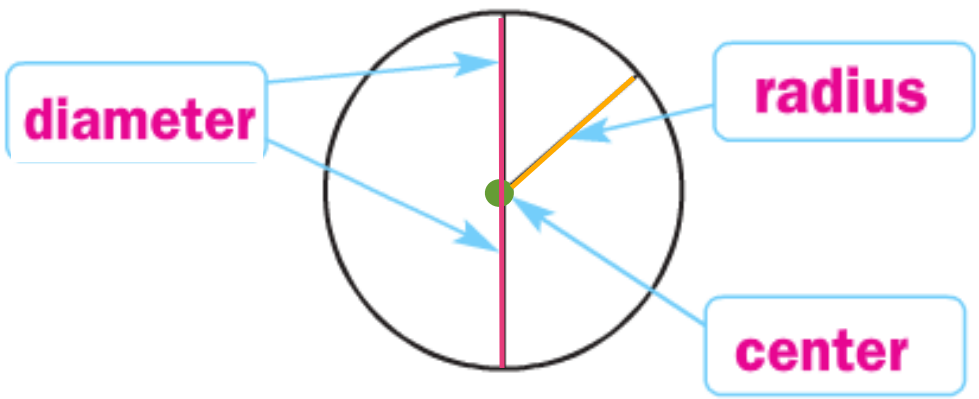
Circumference - The distance around a circle.

Circle - The set of all points in a plane that are the same distance from a point.

Center - The point from which all points on a circle are the same distance.

Diameter - The distance across a circle through its center.

Radius - The distance from the center to any point on the circle.



Real-World Link

1. The table shows the approximate measurements of two sizes of hula hoops.

Size	Radius (in.)	Diameter (in.)	Circumference (in.)
child	14	28	88
adult	20	40	126

a. Describe the relationship between the diameter and radius of each hula hoop. **Sample answer: the diameter is twice the radius.**

b. Describe the relationship between the circumference and diameter of each hula hoop. **Sample answer: circumference is about three times the diameter.**

Radius and Diameter

The diameter ***d*** of a circle is twice its radius.

$$d = 2r$$

The radius ***r*** of a circle is half its diameter.

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

Examples

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

Write the formula. $r = \frac{d}{2}$

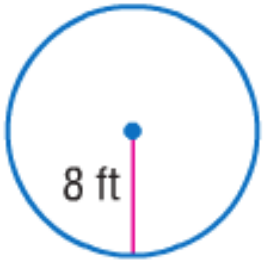
Substitute the given value. $r = \frac{14}{2}$

Divide. $r = 7$

Label the answer. $\boxed{7 \text{ inches}}$

Examples

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



Write the formula. $d = 2r$

Substitute the given value. $d = 2(8)$

Multiply. $d = 16$

Label the answer. $\boxed{16 \text{ ft}}$

Got It? Do these problems to find out.

Find the radius or diameter of each circle with the given dimension.

a. $d = 23$ cm

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

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

$$\boxed{11.5 \text{ cm}}$$

b. $r = 3$ in.

$$d = 2r$$

$$d = 2(3)$$

$$\boxed{6 \text{ in}}$$

Got It? Do these problems to find out.

Find the radius or diameter of each circle with the given dimension.

c. $d = 16$ yd

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

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

$$\boxed{8 \text{ yd}}$$

d. $r = 5.2$

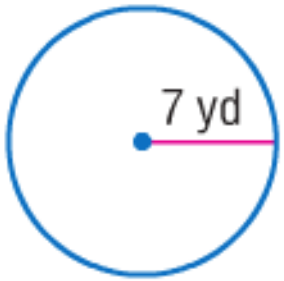
$$d = 2r$$

$$d = 2(5.2)$$

$$\boxed{10.4}$$

Got It? Do these problems to find out.

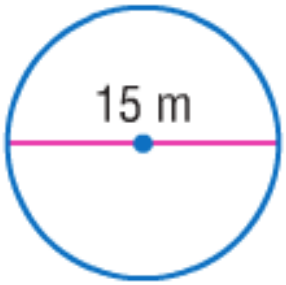
Find the radius or diameter of each circle with the given dimension.



$$d = 2r$$

$$d = 2(7)$$

$$\boxed{14 \text{ yd}}$$



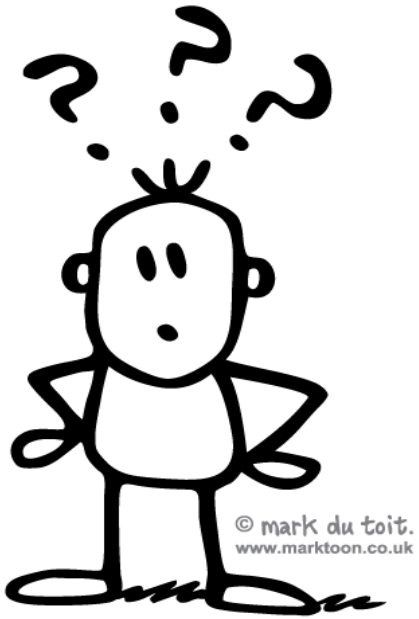
$$r = \frac{d}{2}$$

$$r = \frac{15}{2}$$

$$\boxed{7.5 \text{ m}}$$

Video:

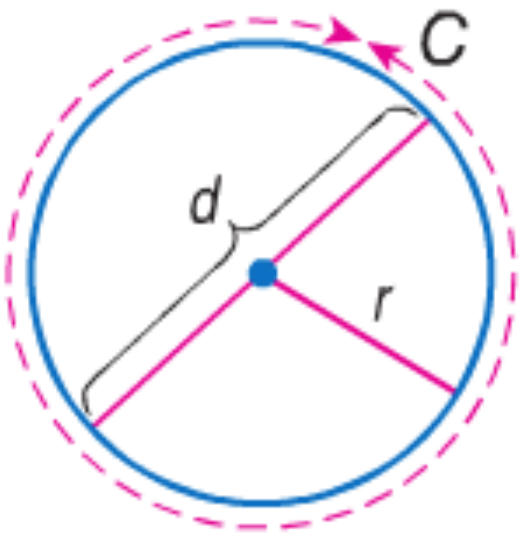
What is circumference?



Circumference

$$C = \pi d$$

* Use when you are given the diameter *



$$C = 2\pi r$$

* Use when you are given the radius *

The Value of Pi:

pi (π) - The ratio of the circumference of a circle to its diameter.

The value of pi is 3.1415926.....

Approximations for pi are 3.14 and $\frac{22}{7}$.

* Use the fraction when multiplying by multiples of 7 *

Examples

3. **Find the circumference of a circle with a radius of 21 inches.**

Write the formula.

$$C = 2\pi r$$

Substitute the given values.

* Choose either value of pi *

$$C = 2 \cdot \frac{22}{7} \cdot 21$$

Multiply and Simplify.

$$C = \frac{2}{1} \cdot \frac{22}{\cancel{7}_{1}} \cdot \frac{\cancel{21}^{3}}{1}$$

Label the answer.

$$\boxed{132 \text{ in.}}$$

Examples

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

Write the formula. $C = 2\pi r$

Substitute the given values. $C = 2 \cdot 3.14 \cdot 5$

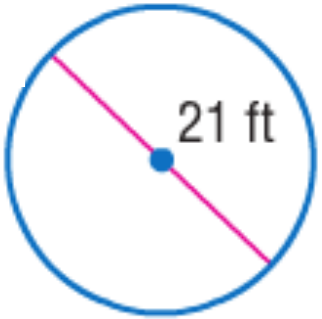
* Choose either value of pi *

Multiply. $C = 10 \cdot 3.14$

Label the answer. $\boxed{31.4 \text{ in.}}$

Examples

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



Write the formula.

$$C = \pi d$$

Substitute the given values.

* Choose either value of pi *

$$C = \frac{22}{7} \cdot 21$$

Multiply and Simplify.

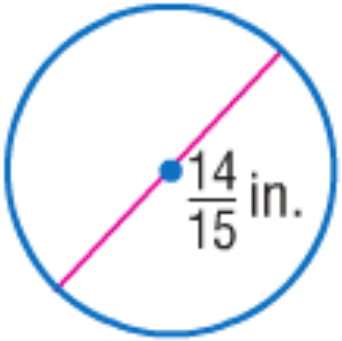
$$C = \frac{22}{\cancel{7}_{1}} \cdot \frac{\cancel{21}^{3}}{1}$$

Label the answer.

$$\boxed{66 \text{ ft}}$$

Examples

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



Write the formula.

$$C = \pi d$$

Substitute the given values.

* Choose either value of pi *

$$C = \frac{22}{\cancel{7}_{1}} \cdot \frac{\cancel{14}^{2}}{15} = \frac{44}{15}$$

Multiply and Simplify.

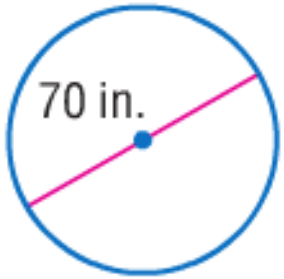
Label the answer.

$$\boxed{2\frac{14}{15} \text{ in.}}$$

Got It? Do these problems to find out.

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

e.

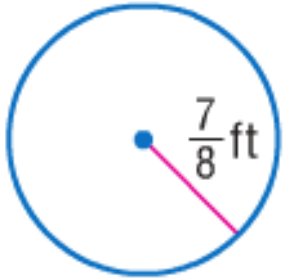


$$C = \pi d$$

$$C = \frac{22}{\cancel{7}_{1}} \cdot \frac{\cancel{70}^{10}}{1}$$

$$\boxed{220 \text{ in.}}$$

f.



$$C = 2\pi r$$

$$C = \frac{\cancel{2}^{1}}{1} \cdot \frac{22}{\cancel{7}_{1}} \cdot \frac{\cancel{7}^{1}}{\cancel{8}_{4}}$$

$$\boxed{5\frac{1}{2} \text{ ft}}$$

Real World Example

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. Round to the nearest tenth.

$$C = \pi d$$

$$C = 3.14 \cdot 23$$

$$\boxed{72.2 \text{ ft}}$$

Got It? Do this problem to find out.

g. A circular fence is being placed to surround a tree. The diameter of the fence is 4 feet. How much fencing is used? Use 3.14 for π. Round to the nearest tenth if necessary.

$$C = \pi d$$

$$C = 3.14 \cdot 4$$

$$\boxed{12.56 \text{ ft}}$$

Got It? Do this problem to find out.

At a local park, Sara can choose between two circular paths to walk. One path has a diameter of 120 yards, and the other has a radius of 45 yards. How much farther can Sara walk on the longer path than the shorter path if she walks around the path once? _____

$$C = \pi d$$

C = 3.14(120)

C = 376.8 yd

$$C = 2\pi r$$

C = 2(3.14)(45)

C = 6.28(45)

C = 282.6 yd

376.8
- 282.6

94.2 yd

Homework:

Pg. 617-618

1-18 (all)