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

<table>
<thead>
<tr>
<th>Size</th>
<th>Radius (in.)</th>
<th>Diameter (in.)</th>
<th>Circumference (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>child</td>
<td>14</td>
<td>28</td>
<td>88</td>
</tr>
<tr>
<td>adult</td>
<td>20</td>
<td>40</td>
<td>126</td>
</tr>
</tbody>
</table>

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

$$d = 2r$$

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

$$r = \frac{d}{2}$$
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. \[ 7 \text{ inches} \]
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. \[ 16 \text{ ft} \]
Find the radius or diameter of each circle with the given dimension.

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

$$r = \frac{d}{2} = \frac{23}{2} = 11.5 \text{ cm}$$

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

$$d = 2r = 2(3) = 6 \text{ in}.$$
Find the radius or diameter of each circle with the given dimension.

c. \( d = 16 \text{ yd} \)

\[
\begin{align*}
    r &= \frac{d}{2} \\
    r &= \frac{16}{2} \\
    r &= 8 \text{ yd}
\end{align*}
\]

d. \( r = 5.2 \)

\[
\begin{align*}
    d &= 2r \\
    d &= 2(5.2) \\
    d &= 10.4
\end{align*}
\]
Find the radius or diameter of each circle with the given dimension.

\[
d = 2r
\]

\[
d = 2(7)
\]

\[
14 \text{ yd}
\]

\[
r = \frac{d}{2}
\]

\[
r = \frac{15}{2}
\]

\[
7.5 \text{ m}
\]
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:

\( \pi \) - 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 *
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.

\[ C = \frac{2}{1} \cdot \frac{22}{7} \cdot \frac{21^3}{1} \]

Label the answer.

\[ 132 \text{ in.} \]
Find the circumference of each circle. Use 3.14 or $\frac{22}{7}$ for $\pi$.

Write the formula.

$$C = 2\pi r$$

Substitute the given values.

* Choose either value of pi *

Multiply.

$$C = 2 \cdot 3.14 \cdot 5$$

Label the answer.

$$C = 10 \cdot 3.14$$

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

Write the formula.

$C = \pi d$

Substitute the given values.

* Choose either value of pi *

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

Multiply and Simplify.

$C = \frac{22}{7} \cdot \frac{21}{1}$

Label the answer.

66 ft
Examples

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

Write the formula.

$C = \pi d$

Substitute the given values.

* Choose either value of pi *

Multiply and Simplify.

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

Label the answer.

$2 \frac{14}{15}$ in.
Find the circumference of each circle. Use 3.14 or $\frac{22}{7}$ for $\pi$.

\[ C = \pi d \]

\[ C = \frac{22}{7} \cdot \frac{70^{10}}{1} \]

220 in.

\[ C = 2\pi r \]

\[ C = \frac{2}{1} \cdot \frac{22}{7} \cdot \frac{7}{8} \]

$5 \frac{1}{2}$ ft
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.

\[ C = \pi d \]

\[ C = 3.14 \cdot 23 \]

72.2 ft
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 \( \pi \). Round to the nearest tenth if necessary.

\[
C = \pi d
\]

\[
C = 3.14 \cdot 4
\]

12.56 ft
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?

\[ C = \pi d \]
\[ C = 3.14(120) \]
\[ C = 376.8 \text{ yd} \]

\[ C = 2\pi r \]
\[ C = 2(3.14)(45) \]
\[ C = 282.6 \text{ yd} \]

\[ 376.8 - 282.6 = 94.2 \text{ yd} \]
Homework:

Pg. 617-6118
# 1-18 (all)