Area of a Circle

Chapter 8 Lesson 2

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

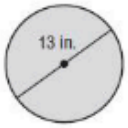
1. $d = 6$ cm

2. $r = 11$ ft

Find the circumference of each circle. Use 3.14 or $\frac{22}{7}$ for π. Round to the nearest tenth if necessary.

3.

4.



5. **TEST PRACTICE** Charlotte has a trampoline in her backyard. The diameter of the trampoline is 14 feet. What method can Charlotte use to find the circumference of the trampoline?

A. Multiply the diameter by π.

B. Multiply the diameter by 2, and then multiply by π.

C. Multiply the diameter by 2.

D. Divide the diameter by 2, and then multiply by π.

Answers:

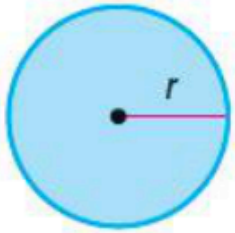
1. R = 3cm
2. D = 22ft
3. 31.4 cm
4. 40.8 in
5. A

Key Concept Area of a Circle

Words The area A of a circle equals the product of π and the square of its radius r.

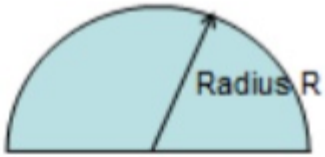
Symbols $A = \pi r^2$

Model

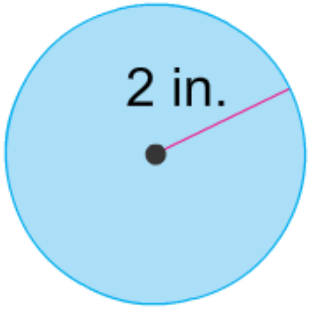


Area of a Semicircle:
A semicircle is a half of a circle.

$$\text{Area} = \frac{1}{2}\pi r^2$$



1. Find the area of the circle. Use 3.14 for π.



1 Estimate $3 \times 2 \times 2 = 12$

2

$A = \pi r^2$	Area of a circle
$A \approx 3.14 \cdot 2^2$	Replace r with 2.
$A \approx 3.14 \cdot 4$	$2^2 = 2 \cdot 2 = 4$
$A \approx 12.56$	Multiply.

3 Check for Reasonableness $12.56 \approx 12$ ✓

4 The area of the circle is approximately 12.56 square inches.

2. Find the area of a circle with a radius of 14 centimeters. Use $\frac{22}{7}$ for π.

1 Estimate $3 \times 14 \times 14 = 588$

2

$A = \pi r^2$	Area of a circle
$A \approx \frac{22}{7} \cdot 14^2$	Replace π with $\frac{22}{7}$ and r with 14.
$A \approx \frac{22}{7} \cdot 196$	$14^2 = 14 \cdot 14 = 196$
$A \approx \frac{22}{\cancel{7}_{1}} \cdot \cancel{196}^{28}$	Divide by the GCF, 7.
$A \approx 616$	Multiply.

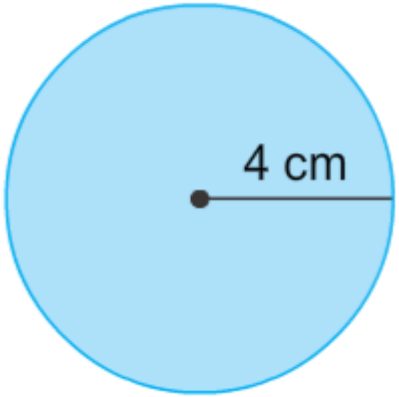
3 Check for Reasonableness $616 \approx 588$ ✓

4 The area of the circle is approximately 616 square centimeters.

Practice Problem:

1. Find the area of the circle.

Use 3.14 for pie.



2. Find the area of a circle with a radius of 7 meters. Use 22/7 for pie.

Answers:

1. $50.24\ cm^2$
2. $154\ m^2$

3. Find the area of the face of the Virginia quarter with a diameter of 24 millimeters. Use 3.14 for π. Round to the nearest tenth if necessary.

1. The radius is $\frac{1}{2}(24)$ or 12 millimeters.

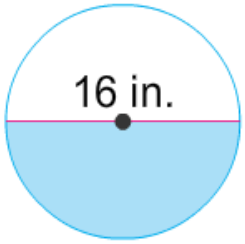
2. $A = \pi r^2$ — Area of a circle

3. $A \approx 3.14 \cdot 12^2$ — Replace r with 12.

4. $A \approx 452.16$ — Multiply.

5. The area is approximately 452.2 square millimeters.

4. Find the area of the semicircle. Use 3.14 for π. Round to the nearest tenth.

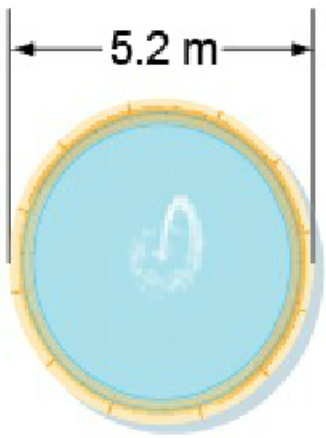


1. $A = \frac{1}{2}\pi r^2$ — Area of a semicircle
2. $A = \frac{1}{2}\pi 8^2$ — Replace r with 8.
3. $A \approx 0.5(3.14)(8^2)$ — Multiply. Use 3.14 for π.
4. $A \approx 100.5$ — Simplify.
5. The area of the semicircle is approximately 100.5 square inches.

Practice Problem:

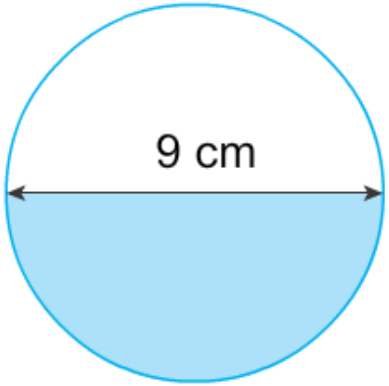
1.

Find the area covered by the fountain. Use 3.14 for π. Round to the nearest tenth if necessary.



2.

Find the area of the semicircle. Use 3.14 for π. Round to the nearest tenth if necessary.



Answers:

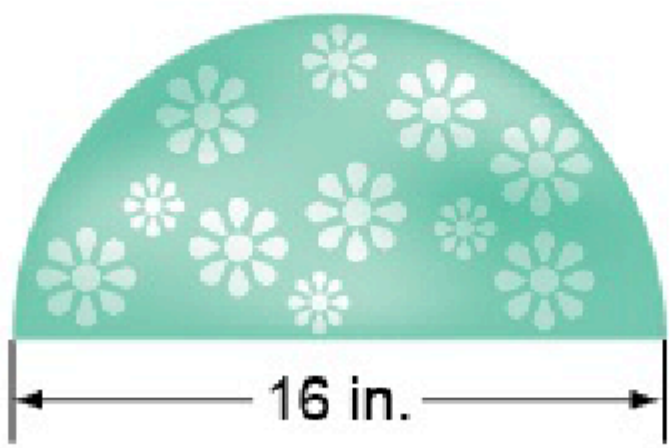
1. $21.2\ m^2$
2. $31.8\ cm^2$

5. On a basketball court, there is a semicircle above the free-throw line that has a radius of 6 feet. Find the area of the semicircle. Use 3.14 for π. Round to the nearest tenth.

1. $A = \frac{1}{2}\pi r^2$ — Area of a semicircle
2. $A \approx 0.5(3.14)(6^2)$ — Replace π with 3.14 and r with 6.
3. $A \approx 0.5(3.14)(36)$ — $6^2 = 6 \cdot 6 = 36$
4. $A \approx 56.5$ — Multiply.
5. So, the area of the semicircle is approximately 56.5 square feet.

Practice Problem:

Tarie is cutting material in the shape of semicircles for her craft project. What is the area of the semicircle? Use 3.14 for π. Round to the nearest tenth if necessary.



Answer:
100.5 in^2

TICKET
Out the Door

Suppose you have
a circular rug
in your living room.

Describe how you would
find the area of the rug.