GRADE 7 · UNIT 4 · LESSON 9

# Fractional Parts of a Circle

**MA.7.GR.1.4**

I can find the area of a half, a quarter, or any fraction of a circle.

# Warm-Up

1. A circle has a radius of 6 cm. Find its area. Use 3.14.
2. What is half of your answer to question 1?
3. What is one quarter of your answer to question 1?
4. A pizza has 6 equal slices. What fraction is 2 slices?

# Warm-Up

1. A circle has a radius of 6 cm. Find its area. Use 3.14.

   **113.04 cm²**

2. What is half of your answer to question 1? **56.52 cm²**

3. What is one quarter of your answer to question 1?

   **28.26 cm²**

4. A pizza has 6 equal slices. What fraction is 2 slices?

   **2/6 = 1/3**

# Vocabulary

**semicircle**

half a circle; its flat edge is the diameter of the whole circle

**quarter circle**

a quarter of a circle; its two straight edges are both radii

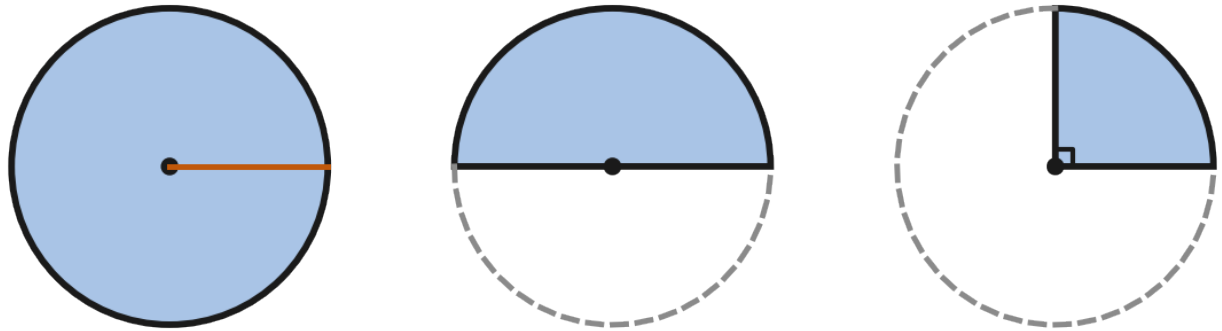
**sector**

a wedge cut from the center, like a slice of pizza

# Notes

## I. A part of a circle

The warm-up's circle, r = 6 cm, and two parts of it.



whole circle
r = 6 cm

semicircle

quarter circle

**No new formula: the whole circle first, then the part.**

# Notes

## II. Two steps, always in this order

1. The whole circle: $A = \pi r^2$.

2. Then take your fraction of that area.

The flat edge of a semicircle is the diameter of the whole circle.

**24 cm across: $r = 12$, whole 452.16 cm², half 226.08 cm².**

# Notes

## III. Any fraction, not just halves

Equal slices? The fraction is the slices you want over the slices altogether.

2 of 6 slices is 2/6, which is 1/3. Reduce it before you multiply.

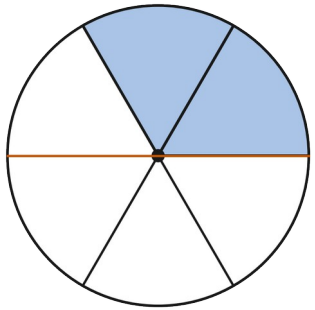
A semicircle is 1/2. A quarter circle is 1/4.

**Round once, at the end — never the whole circle first.**

# Example 1

A 12-inch pizza is cut into 6 equal slices.

Mikel ate 2 slices.



12 in across

**How many square inches did Mikel eat? Use 3.14.**

# Example 1

$$r = 12 \div 2 = 6$$

$$A = 3.14 \times 6^2 = 113.04 \text{ in}^2$$

Is 113.04 the answer? Who ate the whole pizza?

# Example 1

$r = 12 \div 2 = 6$

$A = 3.14 \times 6^2 = 113.04 \text{ in}^2$

$\frac{2}{6} = \frac{1}{3}$

$113.04 \div 3 = 37.68 \text{ in}^2$

**Answer: 37.68 in²**

# Your Turn

A pizza 14 in across is cut into 8 equal slices.

Find the area of 3 slices. Use 3.14.

# Your Turn

A pizza 14 in across is cut into 8 equal slices.

Find the area of 3 slices. Use 3.14.

Radius: $14 \div 2 = 7$

Whole pizza: $3.14 \times 7^2 = 153.86$

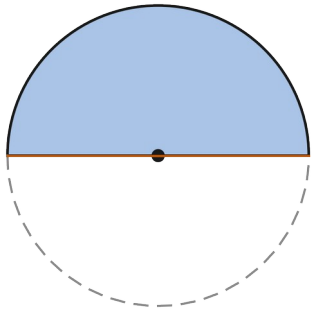
3 of 8 slices: $153.86 \times 3 \div 8 \approx 57.70$

**Answer: 57.70 in²**

# Example 2

A semicircular window is 4 ft across the bottom.

Glass costs $22 per square foot.



4 ft across

**What does the glass cost? Use 3.14.**

# Example 2

$r = 4 \div 2 = 2$

whole: $3.14 \times 2^2 = 12.56$ ft$^2$

half: $12.56 \div 2 = 6.28$ ft$^2$

6.28 square feet of glass. Are we finished?

# Example 2

$r = 4 \div 2 = 2$

whole: $3.14 \times 2^2 = 12.56 \text{ ft}^2$

half: $12.56 \div 2 = 6.28 \text{ ft}^2$

$6.28 \times 22 = 138.16$

**Answer: $138.16**

# Your Turn

A circular garden has a radius of 20 ft.

A quarter of it is a rose bed. Mulch is $2 per square foot.

What does mulch for the rose bed cost? Use 3.14.

# Your Turn

A circular garden has a radius of 20 ft.

A quarter of it is a rose bed. Mulch is $2 per square foot.

What does mulch for the rose bed cost? Use 3.14.

Whole garden: $3.14 \times 20^2 = 1{,}256$

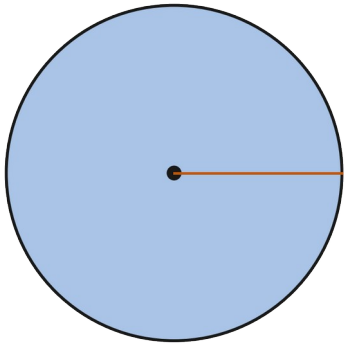
A quarter: $1{,}256 \div 4 = 314$

Cost: $314 \times 2 = 628$

**Answer: $628**

# Whiteboards · Question 1 of 9

Find the shaded area. Use 3.14.

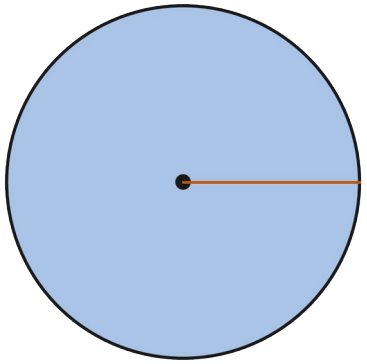


r = 4 cm

**Answer it.**

# Whiteboards · Question 1 of 9

Find the shaded area. Use 3.14.



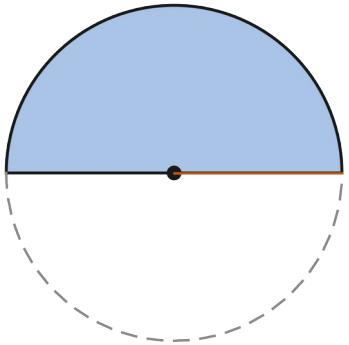
r = 4 cm

$$A = 3.14 \times 4^2 = 3.14 \times 16 = 50.24$$

**Answer: 50.24 cm²**

# Whiteboards · Question 2 of 9

Find the shaded area. Use 3.14.

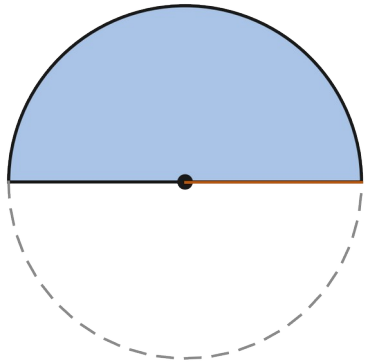


r = 4 cm

**Answer it.**

# Whiteboards · Question 2 of 9

Find the shaded area. Use 3.14.



r = 4 cm

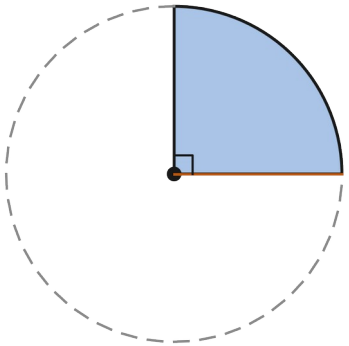
Whole circle: $3.14 \times 4^2 = 50.24$

Half: $50.24 \div 2 = 25.12$

**Answer: 25.12 cm²**

# Whiteboards · Question 3 of 9

Find the shaded area. Use 3.14.

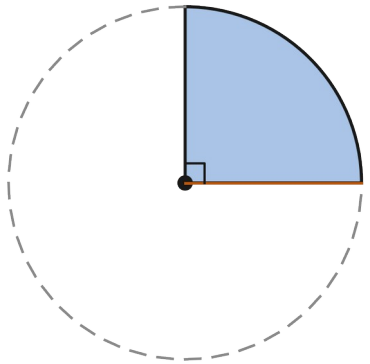


r = 4 cm

**Answer it.**

# Whiteboards · Question 3 of 9

Find the shaded area. Use 3.14.



r = 4 cm

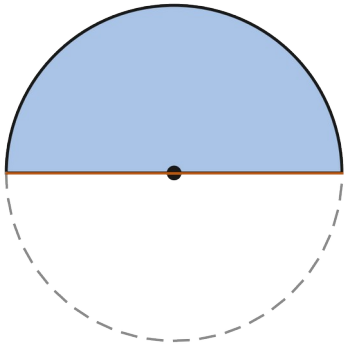
Whole circle: $3.14 \times 4^2 = 50.24$

A quarter: $50.24 \div 4 = 12.56$

**Answer: 12.56 cm²**

# Whiteboards · Question 4 of 9

Find the shaded area. Use 3.14.

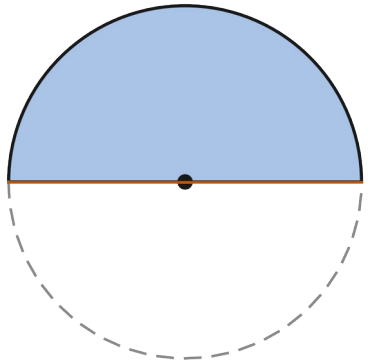


8 cm across

**Answer it.**

# Whiteboards · Question 4 of 9

Find the shaded area. Use 3.14.



8 cm across

Radius: $8 \div 2 = 4$

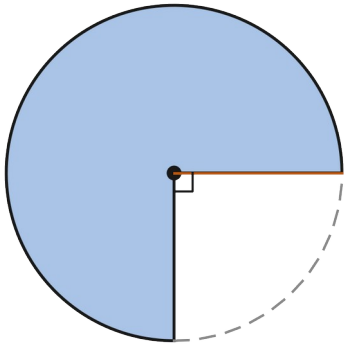
Whole circle: $3.14 \times 4^2 = 50.24$

Half: $50.24 \div 2 = 25.12$

**Answer: 25.12 cm²**

# Whiteboards · Question 5 of 9

Find the shaded area. Use 3.14.

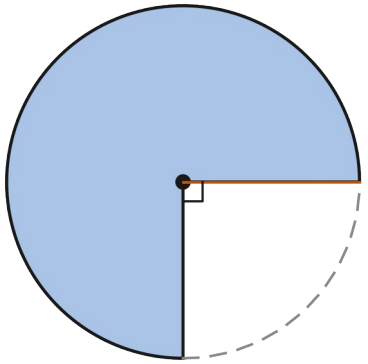


r = 4 cm

**Answer it.**

# Whiteboards · Question 5 of 9

Find the shaded area. Use 3.14.




Whole circle: $3.14 \times 4^2 = 50.24$

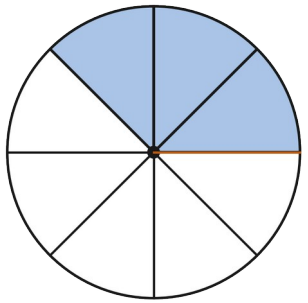
Three quarters: $50.24 \times 3 \div 4 = 37.68$

**Answer: 37.68 cm²**

# Whiteboards · Question 6 of 9

The circle is cut into 8 equal slices.

**Find the shaded area. Use 3.14.**



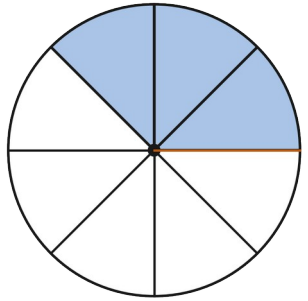
r = 4 cm

**Answer it.**

# Whiteboards · Question 6 of 9

The circle is cut into 8 equal slices.

**Find the shaded area. Use 3.14.**



r = 4 cm

Whole circle: $3.14 \times 4^2 = 50.24$

3 of 8 slices: $50.24 \times 3 \div 8 = 18.84$

**Answer: 18.84 cm²**

# Whiteboards · Question 7 of 9

A circle with a radius of 9 cm is cut into 6 equal slices.

**Find the area of one slice. Use 3.14.**

**A.** 1,526.04 $cm^2$

**B.** 42.39 $cm^2$

**C.** 4.71 $cm^2$

**D.** 254.34 $cm^2$

**Answer it.**

# Whiteboards · Question 7 of 9

A circle with a radius of 9 cm is cut into 6 equal slices.

**Find the area of one slice. Use 3.14.**

Whole circle: $3.14 \times 9^2 = 254.34$

One of 6 slices: $254.34 \div 6 = 42.39$

**Answer: B — 42.39 cm²**

# Whiteboards · Question 8 of 9

A semicircular rug is 6 ft across. It lies 2 ft from the door.

**Find the area of the rug. Use 3.14.**

**A.** 14.13 $ft^2$

**B.** 56.52 $ft^2$

**C.** 3.53 $ft^2$

**D.** 28.26 $ft^2$

**Answer it.**

# Whiteboards · Question 8 of 9

A semicircular rug is 6 ft across. It lies 2 ft from the door.

**Find the area of the rug. Use 3.14.**

Radius: $6 \div 2 = 3$

Whole circle: $3.14 \times 3^2 = 28.26$

Half: $28.26 \div 2 = 14.13$

**Answer: A — 14.13 ft²**

# Whiteboards · Question 9 of 9

A semicircular window is 10 ft across the bottom. Glass costs $18 per square foot.

**What does the glass cost?**

**Write your answer in sentences.**

# Whiteboards · Question 9 of 9

A semicircular window is 10 ft across the bottom. Glass costs $18 per square foot.

**What does the glass cost?**

Radius: $10 \div 2 = 5$

Whole circle: $3.14 \times 5^2 = 78.5$

Half: $78.5 \div 2 = 39.25$

Cost: $39.25 \times 18 = 706.5$

**Answer: $706.50**

# Before You Go

A part of a circle is a fraction of the whole circle.

Find the whole circle first, then take the fraction.

The flat edge of a semicircle is the diameter.

# IXL

1. Open IXL and start today's skills.
2. Work on paper where the question needs work. The answer box does not show it.
3. Every skill listed is required, to a SmartScore of 60. Due by the Unit 4 test.

**Today's skills — all required**

Area of circles (YA8)