GRADE 7 · UNIT 4 · LESSON 10

Circumference or Area?

MA.7.GR.1.3 · MA.7.GR.1.4

I can decide whether a problem wants the circumference or the area, and then find it.

Warm-Up

1. A circle: radius 4 cm. Circumference? Use 3.14.
2. The same circle. Find its area.
3. One answer is in cm, one in cm^2. Which? Why?
4. A fence around a round garden: C or A?

Warm-Up

1. A circle: radius 4 cm. Circumference? Use 3.14. **25.12 cm**
2. The same circle. Find its area. **50.24 cm^2**
3. One answer is in cm, one in cm^2. Which? Why?

   25.12 cm is around; 50.24 cm^2 covers
4. A fence around a round garden: C or A?

   the circumference

Vocabulary

circumference

the distance around a circle; a length, in cm, in, ft or m

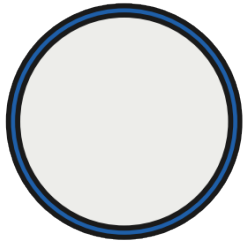
area

the space inside a circle; a surface, in cm^2, in^2, ft^2 or m^2

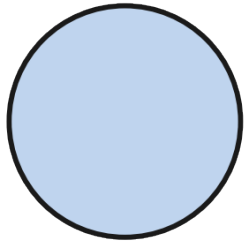
Notes

I. One question to ask

Is the job going around the circle, or covering what is inside it?



AROUND: circumference
the rim: a length, cm



INSIDE: area
the face: a surface, cm^2

Same circle, two questions, two units.

Notes

II. Words that give it away

The job decides. These words usually point the way:

AROUND: circumference	INSIDE: area
fence · edging · trim · ribbon	paint · carpet · sod · mulch
border · rim · railing · rope	cover · tile · glass · asphalt
one full turn · one lap	fill · surface · face
how far around	how much space

Clues, not rules. No clue? Would you walk the edge, or cover the middle?

Notes

III. The units are the check

A circumference is a length: cm, in, ft, m.

An area covers a surface: cm^2, in^2, ft^2, m^2.

“How many feet of asphalt fill the roundabout?”

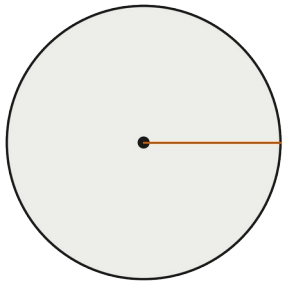
Filling is an area, so the answer is in square feet.

Decide from the job, not from the unit in the question.

Example 1

A circular roundabout has a radius of 75 ft.

(a) How much asphalt fills it? (b) How long is the painted line around it?



Which is which? Use 3.14.

Example 1

$$A = 3.14 \times 75^2 = 3.14 \times 5{,}625$$

$$A = 17{,}662.5 \text{ ft}^2$$

Example 1

$A = 3.14 \times 75^2 = 17{,}662.5 \text{ ft}^2$

$C = 2 \times 3.14 \times 75 = 471 \text{ ft}$

Answer: 17,662.5 ft² of asphalt; 471 ft of paint

Your Turn

A circular lawn has a radius of 15 m.

How much sod covers it? Use 3.14.

Your Turn

A circular lawn has a radius of 15 m.

How much sod covers it? Use 3.14.

Sod covers the inside, so find the area.

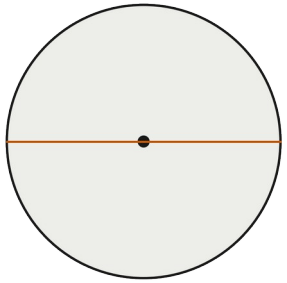
$A = 3.14 \times 15^2 = 3.14 \times 225 = 706.5$

Answer: 706.5 m²

Example 2

A circular trampoline is 12 ft across.

Netting goes around the edge. A mat covers the surface.



12 ft across

How much netting, and how much mat? Use 3.14.

Example 2

$$C = \pi d = 3.14 \times 12 = 37.68 \text{ ft}$$

No halving for the circumference. The mat is another story.

Example 2

$C = 3.14 \times 12 = 37.68 \text{ ft}$

$r = 12 \div 2 = 6$

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

Answer: 37.68 ft of netting; 113.04 ft² of mat

Your Turn

A round garden is 24 ft across. How much fence goes around it?

A round window is 28 in across. How much glass fills it?

Use 3.14.

Your Turn

A round garden is 24 ft across. How much fence goes around it?

A round window is 28 in across. How much glass fills it?

Use 3.14.

Fence goes around: $C = 3.14 \times 24 = 75.36$

Glass fills the inside: $r = 28 \div 2 = 14$

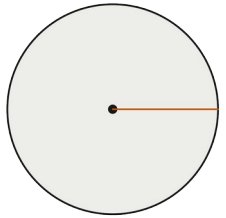
$A = 3.14 \times 14^2 = 615.44$

Answer: 75.36 ft and 615.44 in²

Whiteboards · Question 1 of 9

A circular pond has a radius of 10 m. You walk all the way around the edge.

How far do you walk?

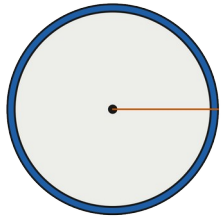


Answer it.

Whiteboards · Question 1 of 9

A circular pond has a radius of 10 m. You walk all the way around the edge.

How far do you walk?



r = 10 m

Around the edge, so the circumference.

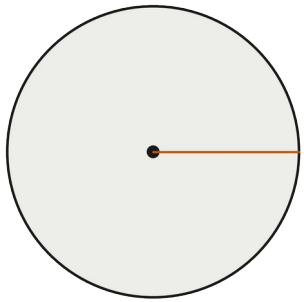
$C = 2 \times 3.14 \times 10 = 62.8$

Answer: 62.8 m

Whiteboards · Question 2 of 9

The same pond. A net covers the whole surface.

How much surface does the net cover?



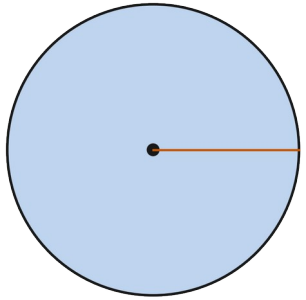
r = 10 m

Answer it.

Whiteboards · Question 2 of 9

The same pond. A net covers the whole surface.

How much surface does the net cover?



r = 10 m

The surface, so the area.

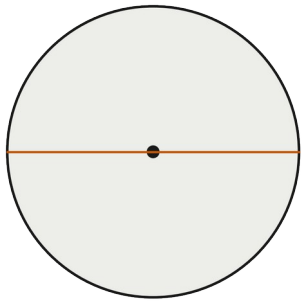
$A = 3.14 \times 10^2 = 3.14 \times 100 = 314$

Answer: 314 m²

Whiteboards · Question 3 of 9

A circular stage is 10 m across. Tape runs around its edge.

How long is the tape?



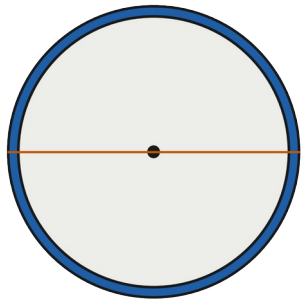
d = 10 m

Answer it.

Whiteboards · Question 3 of 9

A circular stage is 10 m across. Tape runs around its edge.

How long is the tape?



d = 10 m

Around the edge, so the circumference.

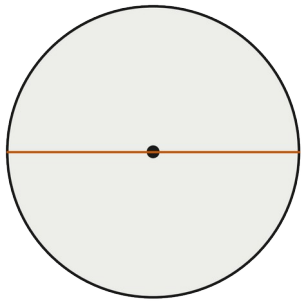
$C = 3.14 \times 10 = 31.4$

Answer: 31.4 m

Whiteboards · Question 4 of 9

The same stage. Paint covers the whole floor.

How much floor is painted?



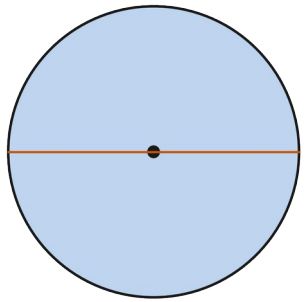
d = 10 m

Answer it.

Whiteboards · Question 4 of 9

The same stage. Paint covers the whole floor.

How much floor is painted?



d = 10 m

The floor, so the area. Radius: $10 \div 2 = 5$

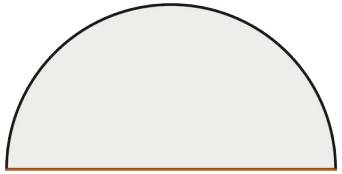
$A = 3.14 \times 5^2 = 3.14 \times 25 = 78.5$

Answer: 78.5 m²

Whiteboards · Question 5 of 9

A semicircular patio is 10 m across. Paving covers its surface.

How much surface is paved?



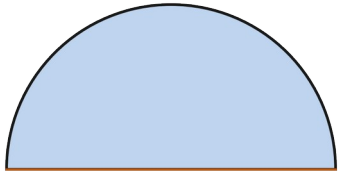
10 m across

Answer it.

Whiteboards · Question 5 of 9

A semicircular patio is 10 m across. Paving covers its surface.

How much surface is paved?



10 m across

Radius: $10 \div 2 = 5$

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

Half: $78.5 \div 2 = 39.25$

Answer: 39.25 m²

Whiteboards · Question 6 of 9

A circular track has a radius of 40 m. A runner does 3 laps in 12 minutes.

How far does she run?

Answer it.

Whiteboards · Question 6 of 9

A circular track has a radius of 40 m. A runner does 3 laps in 12 minutes.

How far does she run?

One lap: $2 \times 3.14 \times 40 = 251.2$

Three laps: $251.2 \times 3 = 753.6$

Answer: 753.6 m

Whiteboards · Question 7 of 9

A Ferris wheel is 300 ft across.

How far does a rider travel in one full turn? Use 3.14.

A. 471 ft

B. 1,884 ft

C. 70,650 ft^2

D. 942 ft

Answer it.

Whiteboards · Question 7 of 9

A Ferris wheel is 300 ft across.

How far does a rider travel in one full turn? Use 3.14.

One turn is the circumference.

$C = 3.14 \times 300 = 942$

Answer: D — 942 ft

Whiteboards · Question 8 of 9

A round table is 4 ft across. A cloth hangs 1 ft over its edge all the way around.

How much cloth is needed? Use 3.14.

A. $12.56\ ft^2$

B. $18.84\ ft$

C. $28.26\ ft^2$

D. $113.04\ ft^2$

Answer it.

Whiteboards · Question 8 of 9

A round table is 4 ft across. A cloth hangs 1 ft over its edge all the way around.

How much cloth is needed? Use 3.14.

Cloth across: $4 + 1 + 1 = 6$, so the radius is $6 \div 2 = 3$

$A = 3.14 \times 3^2 = 28.26$

Answer: C — 28.26 ft²

Whiteboards · Question 9 of 9

A circular pool is 14 ft across. A cover costs $3 per square foot, and rope around the edge costs $2 per foot.

Find the total bill.

Write your answer in sentences.

Whiteboards · Question 9 of 9

A circular pool is 14 ft across. A cover costs $3 per square foot, and rope around the edge costs $2 per foot.

Find the total bill.

Cover (area): $3.14 \times 7^2 = 153.86$, and $153.86 \times 3 = 461.58$

Rope (around): $3.14 \times 14 = 43.96$, and $43.96 \times 2 = 87.92$

Total: $461.58 + 87.92 = 549.5$

Answer: $549.50

Before You Go

Around the edge is the circumference: a length.

Covering the inside is the area: square units.

Decide which first. Then find it.

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

Circles: word problems (P56)