LESSON MAKER PRO

Circle Connections

Use radius and diameter to find distance around and space inside.

GRADE 7 · 7.GM.B.20

7.GM.B.20 "Explain the relationships among circumference, diameter, area, and radius of a circle to demonstrate understanding of formulas for the area and circumference of a circle. a. Informally derive the formula for area of a circle. b..."

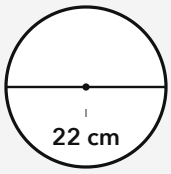
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THE BIG IDEA

The diameter is twice the radius. Circumference is $C = \pi d = 2\pi r$. If you cut a circle into many thin wedges and alternate them, the pieces nearly form a rectangle with base $C/2 = \pi r$ and height r, so $A = \pi r^2$.

WORKED EXAMPLE

Use the circle to find its circumference and area. Leave your answers in terms of π.

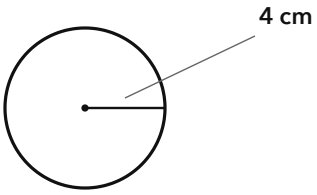


1. The radius is $22 \div 2 = 11$ cm.
2. $C = \pi d = \pi \times 22 = 22\pi$ cm.
3. $A = \pi r^2 = \pi \times 11^2 = 121\pi$ cm^2.

Answer: Circumference: 22π cm; area: 121π cm^2

PRACTICE 6 problems

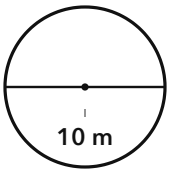
1 Use the circle to find its circumference and area. Leave both answers in terms of π.



ANSWER _____

_____

2 Use the circle to find its circumference and area. Leave both answers in terms of π.



ANSWER _____

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3 A circle has a circumference of 24π inches. Find its radius and area.

ANSWER _____

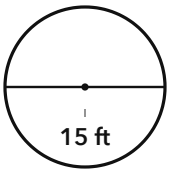
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4 A circle has an area of 81π square feet. Find its radius and circumference.

ANSWER _____

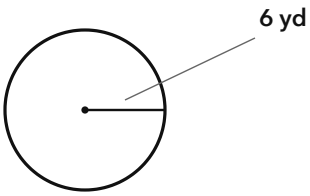
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5 Use the circle to find its circumference in terms of π.



ANSWER _____

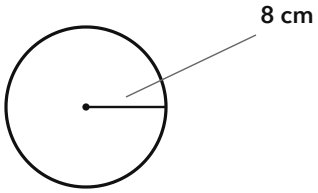
6 Use the circle to find its area in terms of π.



ANSWER _____

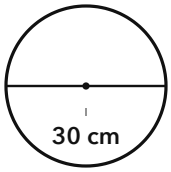
APPLY IT Show your work

1 A skateboard shop makes a round sticker with the measurement shown. How much sticker material is needed, and how long is its outer edge? Leave both answers in terms of π.



ANSWER _____

2 A gaming club orders a round mouse pad with the measurement shown. Find the area of its top and the length of trim needed to go around its edge. Leave both answers in terms of π.



ANSWER _____

CHALLENGE One step up

A circle has a circumference of 36π cm. Find its area and explain how you used the circumference to get it. Write two sentences.

WORK SPACE AND ANSWER

ANSWER KEY

Circle Connections

GRADE 7 · 7.GM.B.20

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the circle to find its circumference and area. Leave both answers in terms of π.	**Circumference: 8π cm; area: 16π cm^2**
2	Use the circle to find its circumference and area. Leave both answers in terms of π.	**Circumference: 10π m; area: 25π m^2**
3	A circle has a circumference of 24π inches. Find its radius and area.	**Radius: 12 in.; area: 144π $in.^2$**
4	A circle has an area of 81π square feet. Find its radius and circumference.	**Radius: 9 ft; circumference: 18π ft**
5	Use the circle to find its circumference in terms of π.	**15π ft**
6	Use the circle to find its area in terms of π.	**36π yd^2**

PART 2 · APPLY IT

1. **Material: 64π cm^2; outer edge: 16π cm** Use $A = \pi r^2$ to find the material needed. Use $C = 2\pi r$ to find the length of the outer edge.
2. **Top area: 225π cm^2; trim: 30π cm** The radius is 15 cm, so the top area is $\pi \times 15^2 = 225\pi$ cm^2. The trim length is the circumference, $\pi \times 30 = 30\pi$ cm.

CHALLENGE

Since 36π = 2πr, the radius is 18 cm. The area is $\pi \times 18^2 = 324\pi$ cm^2.

Accept equivalent exact expressions in terms of π. Check that circumference answers use length units and area answers use square units.