LESSON MAKER PRO

Circle Power Lab

Use radius, diameter, circumference, and area with pi.

GRADE 7 · 7.G.B.4

CCSS.Math.Content.7.G.B.4 "Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle."

NAME _____ DATE _____

CIRCLE FORMULAS

Use C = 2 x pi x r, or C = pi x d, to find circumference. Use A = pi x r x r to find area. Imagine cutting a circle into many equal wedges and alternating them to make a shape like a rectangle. Its base is half the circumference and its height is r, so A = (C/2) x r = pi x r x r.

WORKED EXAMPLE

A circle has a radius of 9 cm. Find its circumference and area in terms of pi.

1. C = 2 x pi x 9
2. C = 18pi cm
3. A = pi x 9 x 9 = 81pi cm^2

Answer: Circumference: 18pi cm; Area: 81pi cm^2

PRACTICE 6 problems

1 A circle has a radius of 4 cm. Find its circumference in terms of pi.

ANSWER _____

2 A circle has a diameter of 10 m. Find its area in terms of pi.

ANSWER _____

3 A circle has a circumference of 14pi inches. Find its radius.

ANSWER _____

4 A circle has an area of 49pi square feet. Find its diameter.

ANSWER _____

5 A circle has a radius of 3 yards. Find its circumference and area in terms of pi.

ANSWER _____

6 A circle has a diameter of 8 cm. Find its circumference and area in terms of pi.

ANSWER _____

APPLY IT Show your work

1 The art club is making a circular badge for its game-design team. The badge has a diameter of 16 cm. What area of the badge will be covered by the design? Give your answer in terms of pi.

WORK SPACE

ANSWER _____

2 A student wants to put an LED strip around the outside edge of a circular gaming desk mat with a radius of 15 inches. How much LED strip is needed? Give your answer in terms of pi.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Circle A has a circumference of 22pi cm. Circle B has twice the radius of Circle A. Find the area of each circle in terms of pi. Then explain why Circle B's area is four times Circle A's area.

_____

_____

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A circle has a radius of 4 cm. Find its circumference in terms of pi.	**8pi cm**
2	A circle has a diameter of 10 m. Find its area in terms of pi.	**25pi m^2**
3	A circle has a circumference of 14pi inches. Find its radius.	**7 inches**
4	A circle has an area of 49pi square feet. Find its diameter.	**14 feet**
5	A circle has a radius of 3 yards. Find its circumference and area in terms of pi.	**Circumference: 6pi yards; Area: 9pi yd^2**
6	A circle has a diameter of 8 cm. Find its circumference and area in terms of pi.	**Circumference: 8pi cm; Area: 16pi cm^2**

PART 2 · APPLY IT

1. **64pi cm^2** The radius is 8 cm because the diameter is 16 cm. Use A = pi x 8 x 8 to get 64pi cm^2.
2. **30pi inches** The LED strip covers the circumference. Use C = 2 x pi x 15 to get 30pi inches.

CHALLENGE

Circle A: 121pi cm^2. Circle B: 484pi cm^2. Circle A has radius 11 cm, so Circle B has radius 22 cm. Doubling the radius multiplies r x r by 2 x 2, so the area is four times as large.

Accept equivalent expressions such as pi(8) for 8pi. Require correct square units for area and linear units for circumference or radius.