

Circle Code Breakers

Use radius, diameter, and pi to find distance around a circle.

GRADE 6 • 6.MG.1.d

6.MG.1.d "Develop the formula for circumference using the relationship between diameter, radius, and pi."

NAME _____

DATE _____

CONNECT THE PARTS

The diameter goes across a circle through its center, and it is twice the radius: $d = 2r$. Circumference is $C = \pi d$. Replace d with $2r$ to get $C = 2\pi r$.

WORKED EXAMPLE

A circle has a radius of 8 cm. Find its circumference in terms of pi.

1. Use $d = 2r$.
2. $d = 2(8) = 16$ cm.
3. Use $C = \pi d = \pi(16)$.

Answer: $C = 16\pi$ cm

PRACTICE 6 problems

- 1** A circle has a diameter of 12 cm. Write its circumference in terms of pi.

ANSWER _____

- 2** A circle has a radius of 7 m. Write its circumference in terms of pi.

ANSWER _____

- 3** The radius of a circle is 5 m. Find the diameter and the circumference in terms of pi.

ANSWER _____

- 4** A circle has a diameter of 15 in. Find its circumference in terms of pi.

ANSWER _____

- 5** A circle has a radius of 11 cm. Find its circumference in terms of pi.

ANSWER _____

- 6** Circle A has a diameter of 20 cm. Circle B has a radius of 10 cm. Do the circles have the same circumference? Write both circumferences.

ANSWER _____

APPLY IT Show your work

- 1** A bike shop adds reflective tape around the rim of a circular bike wheel. The wheel has a diameter of 14 inches. How much tape is needed to go once around the rim? Give an exact answer in terms of π .

WORK SPACE

ANSWER _____

- 2** A circular patch for a gaming backpack has a radius of 6 cm. What length of thread is needed to sew around the edge? Give an exact answer in terms of π .

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A circular running game course has a circumference of 36π m. What are its diameter and radius? Explain how you know.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A circle has a diameter of 12 cm. Write its circumference in terms of pi.	12pi cm
2	A circle has a radius of 7 m. Write its circumference in terms of pi.	14pi m
3	The radius of a circle is 5 m. Find the diameter and the circumference in terms of pi.	d = 10 m; C = 10pi m
4	A circle has a diameter of 15 in. Find its circumference in terms of pi.	15pi in
5	A circle has a radius of 11 cm. Find its circumference in terms of pi.	22pi cm
6	Circle A has a diameter of 20 cm. Circle B has a radius of 10 cm. Do the circles have the same circumference? Write both circumferences.	Yes; Circle A = 20pi cm and Circle B = 20pi cm

PART 2 • APPLY IT

- 14pi inches** Use $C = \pi d$. Substitute 14 for d to get $C = 14\pi$ inches.
- 12pi cm** First find the diameter: $d = 2(6) = 12$ cm. Then use $C = \pi d$ to get 12π cm.

CHALLENGE

d = 36 m and r = 18 m. Since $C = \pi d$, $36\pi = \pi d$, so $d = 36$. The radius is half the diameter, so $r = 18$ m.

Accept equivalent forms such as $\pi(12)$ and 12π . Require correct units when a unit is given.