LESSON MAKER PRO

Around the Circle

Develop circumference formulas, then use them to solve circle problems.

GRADE 6 · 6.MG.1.d

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

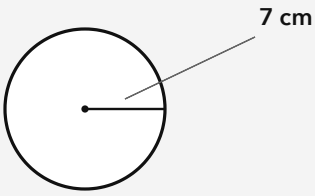
NAME _____ DATE _____

BUILD THE FORMULA

Circumference is the distance around a circle. A circle is about π diameters around, so C = πd. Since d = 2r, you can also write the formula as C = 2πr.

WORKED EXAMPLE

A circle has a radius of 7 cm. Find its circumference in terms of π.

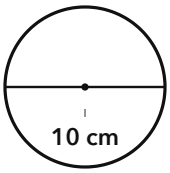


1. Start with C = 2πr.
2. Substitute 7 for r: C = 2π(7).
3. Multiply 2 × 7: C = 14π.

Answer: 14π cm

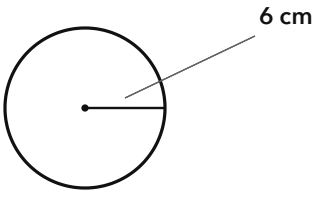
PRACTICE 6 problems

1 Find the circumference of the circle.



ANSWER _____

2 Find the circumference of the circle in terms of π.



ANSWER _____

3 A circle has a circumference of 24π cm. Find its diameter and its radius.

ANSWER _____

4 A circle has a diameter of 15 m. Use π = 3.14 to find its circumference.

ANSWER _____

5 A circle has a radius of 4.5 inches. Find its circumference in terms of π.

ANSWER _____

6 Circle A has a diameter of 18 units. Circle B has a radius of 9 units. Do the circles have the same circumference? Explain.

ANSWER _____

APPLY IT Show your work

1 An art club is making circular patches for backpacks. Each patch has a diameter of 16 cm. Use π = 3.14 to find the length of thread needed to go around one patch.

WORK SPACE

ANSWER _____

2 A maker club has a circular LED ring with a radius of 12 inches. How many inches of wire are needed to go around the ring once? Write your answer in terms of π.

WORK SPACE

ANSWER _____

3 Develop both circumference formulas. Let C be circumference, d be diameter and r be radius. Start with $C/d = \pi$. Write the equation after multiplying both sides by d, and explain why this gives the distance around the circle. Then substitute $d = 2r$ and simplify to obtain a formula using r. Explain why the two forms give the same circumference.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A circular robot arena has a circumference of 69.08 m. Use π = 3.14. Find the diameter and radius, then explain how you found them.

WORK SPACE AND ANSWER

ANSWER KEY

Around the Circle

GRADE 6 · 6.MG.1.d

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the circumference of the circle.	**10π cm**
2	Find the circumference of the circle in terms of π.	**12π cm**
3	A circle has a circumference of 24π cm. Find its diameter and its radius.	**Diameter: 24 cm; radius: 12 cm**
4	A circle has a diameter of 15 m. Use π = 3.14 to find its circumference.	**47.1 m**
5	A circle has a radius of 4.5 inches. Find its circumference in terms of π.	**9π inches**
6	Circle A has a diameter of 18 units. Circle B has a radius of 9 units. Do the circles have the same circumference? Explain.	**Yes. Circle B has a diameter of 18 units, so both circles have a circumference of 18π units.**

PART 2 · APPLY IT

1. **50.24 cm** Use C = πd. Multiply 3.14 × 16 to get 50.24 cm.
2. **24π inches** Use C = 2πr. Substitute 12 for the radius, then multiply 2 × 12.
3. **C = πd; C = π(2r) = 2πr. Both forms give the same circumference because d = 2r.** Multiplying both sides of C/d = π by the positive diameter d gives C = πd: the circumference is π times the diameter. Substitute 2r for d to get C = π(2r) = 2πr. Require the learner equation chain and diameter–radius explanation, not just a numerical answer.

CHALLENGE

Diameter: 22 m; radius: 11 m. Divide 69.08 by 3.14 to find the diameter, then divide the diameter by 2 to find the radius.

Accept equivalent forms such as π(10) for 10π. For answers using 3.14, accept the stated decimal results only when students use the given approximation. For Apply 3, check the actual equation chain from C/d = π and the explanation of substitution d = 2r. Accept equivalent algebraic steps and wording.