

Shape Space Lab

Find area and distance around circles.

GRADE 7 • MA.7.GR.1

MA.7.GR.1 "Solve problems involving two-dimensional figures, including circles."

NAME _____

DATE _____

You will need: Pencil; Ruler

AREA AND CIRCUMFERENCE

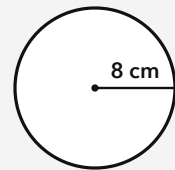
Area measures the space inside a figure. Use $A = lw$ for a rectangle, $A = \frac{1}{2}bh$ for a triangle, $A = bh$ for a parallelogram, $A = \frac{1}{2}(b_1 + b_2)h$ for a trapezoid, and $A = \pi r^2$ for a circle. For the distance around a circle, use $C = 2\pi r$.

WORKED EXAMPLE

Find the area of the circle shown.

1. Use $A = \pi r^2$.
2. Substitute $r = 8$: $A = \pi(8)^2$.
3. Square 8: $A = 64\pi \text{ cm}^2$.
4. The area is $64\pi \text{ cm}^2$.

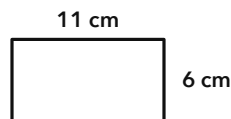
Answer: $64\pi \text{ cm}^2$



PRACTICE 6 problems

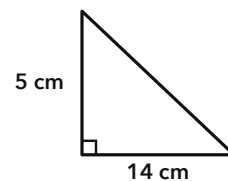
Show your calculation or reasoning. Include units when needed.

- 1** Find the area of the rectangle shown.



ANSWER _____

- 2** Find the area of the right triangle shown.



ANSWER _____

- 3** A parallelogram has a base of 16 cm and a perpendicular height of 3 cm. Find its area.

ANSWER _____

- 4** A trapezoid has bases of 10 cm and 18 cm. Its height is 7 cm. Find its area.

ANSWER _____

- 5** A circle has a radius of 4 cm. Find its area in terms of π .

ANSWER _____

- 6** A circle has a radius of 9 cm. Find its circumference in terms of π .

ANSWER _____

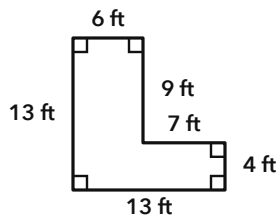
APPLY IT Show your work

- 1** A student designs a circular patch for a backpack. The patch has a radius of 12 cm. How much fabric does the patch cover, and how much trim is needed around its edge? Give exact answers.

- 2** An esports club makes a banner from a 20 in by 14 in rectangle and a triangle attached above it. The triangle has a base of 20 in and a height of 6 in. How much fabric is in the banner?

CHALLENGE One step up

The L-shaped practice patio is shown. What is its area? Explain how you can split the shape or subtract a missing rectangle.

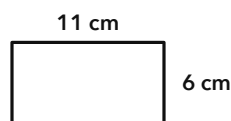
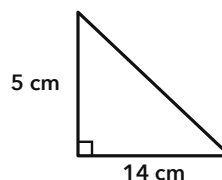


PRACTICE 3**48 cm²****PRACTICE 4****98 cm²****PRACTICE 5****16π cm²****PRACTICE 6****18π cm****APPLY IT 1**

Area = 144π cm²; trim length = 24π cm Use $A = \pi r^2$ to get 144π cm². Use $C = 2\pi r$ to get 24π cm.

APPLY IT 2

340 in² The rectangle has area $20 \times 14 = 280$ in². The triangle has area $\frac{1}{2} \times 20 \times 6 = 60$ in², so the total is 340 in².

PRACTICE 1**66 cm²****PRACTICE 2****35 cm²****CHALLENGE**

106 ft²; subtract the 7 ft by 9 ft missing rectangle from a 13 ft by 13 ft rectangle: $13 \times 13 - 7 \times 9 = 106$.

Accept equivalent exact forms, such as $\pi(4)^2$ for 16π. For the challenge, accept any correct rectangle split or subtraction that gives 106 ft².

