

Shape Space Studio

Split, subtract, and trace composite figures.

GRADE 8 • 8.MG.5

8.MG.5 "The student will solve area and perimeter problems involving composite plane figures, including those in context. Subdivide a plane figure into triangles, rectangles, squares, trapezoids, parallelograms, circles, and semicircles..."

NAME _____

DATE _____

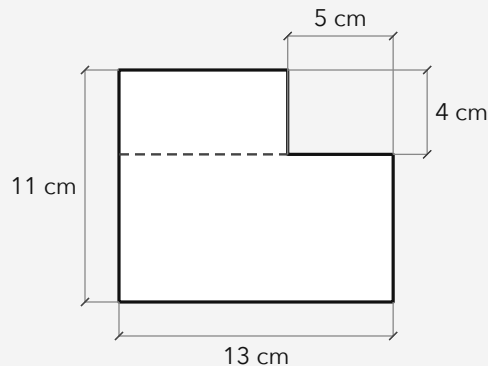
You will need: Pencil; Ruler

BUILD IT, THEN ADD

Split a composite figure into familiar shapes, or subtract a missing part from a larger shape. For perimeter, add only the outside edges. Do not count lines you drew inside the figure. Draw partition lines on the figures when finding area. Show your area calculation. For perimeter, trace only the outside boundary. Use the bold outline for the shape; thin outside lines mark lengths.

WORKED EXAMPLE

Find the area and perimeter of the L-shaped garden.

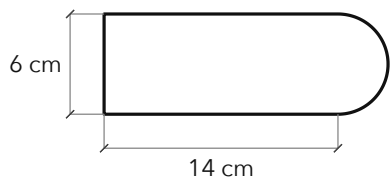


1. View the figure as a 13 cm by 11 cm rectangle with a 5 cm by 4 cm corner missing.
2. Area = $13 \times 11 - 5 \times 4 = 123 \text{ cm}^2$.
3. Perimeter = $7 + 5 + 4 + 8 + 11 + 13 = 48 \text{ cm}$.

Answer: Area = 123 cm^2 ; perimeter = 48 cm

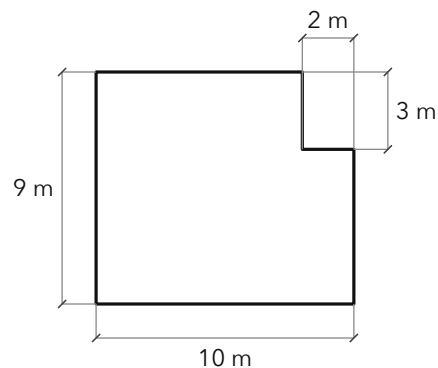
PRACTICE 4 problems

- 1** Find the area of the rectangle and semicircle in terms of π .



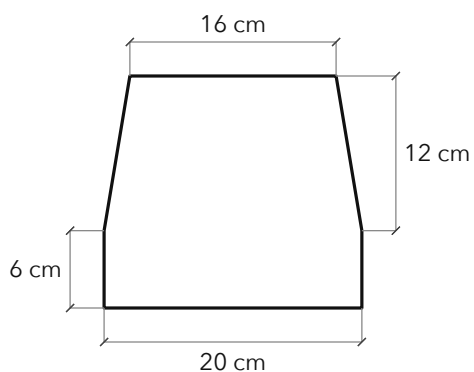
ANSWER _____

- 2** Find the area of the L-shaped floor. Show your calculation.



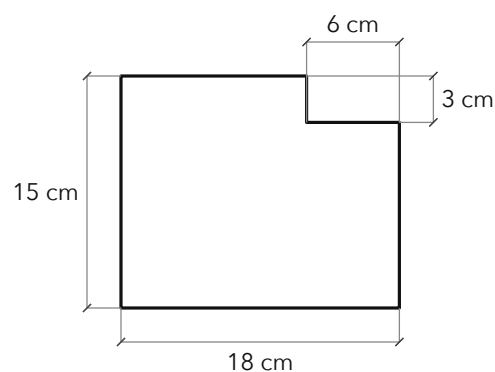
ANSWER _____

- 3** Find the total area of the trapezoid and rectangle.



ANSWER _____

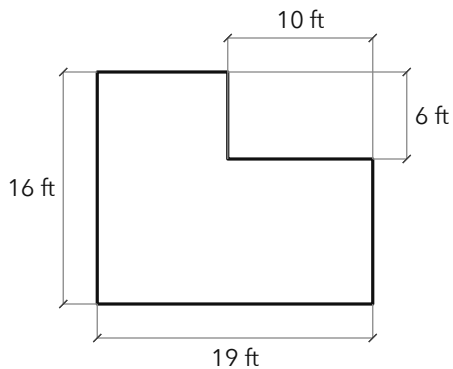
- 4** Find the perimeter of the rectangle with a corner removed.



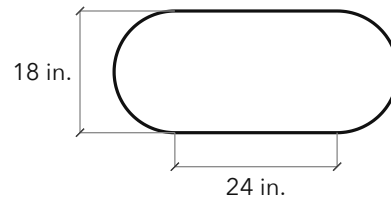
ANSWER _____

APPLY IT Show your work

- 1** The drama club cuts the L-shaped backdrop shown. How many square feet of fabric are needed?

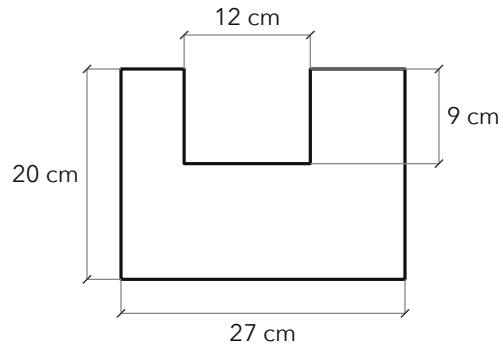
**CALCULATION AND ANSWER**

- 2** An esports banner has a 24 in by 18 in rectangle and two semicircles, each with diameter 18 in, attached to its short sides. Find its area and the length of its outside border in terms of pi.

**CALCULATION AND ANSWER**

CHALLENGE One step up

Find the area and perimeter of the figure. In one sentence, explain how you found the area.

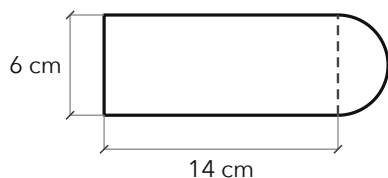


WORK SPACE AND ANSWER

PRACTICE 1

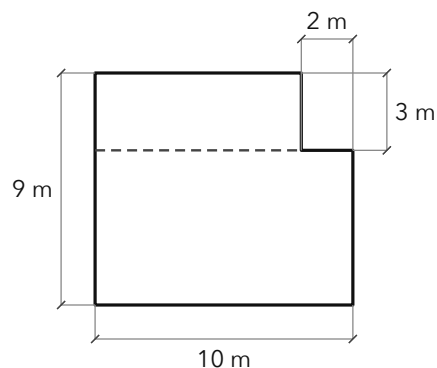
Find the area of the rectangle and semicircle in terms of π .

$$84 + 9\pi/2 \text{ cm}^2$$

**PRACTICE 2**

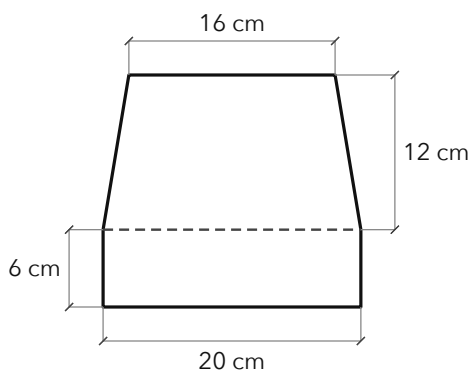
Find the area of the L-shaped floor. Show your calculation.

$$84 \text{ m}^2$$

**PRACTICE 3**

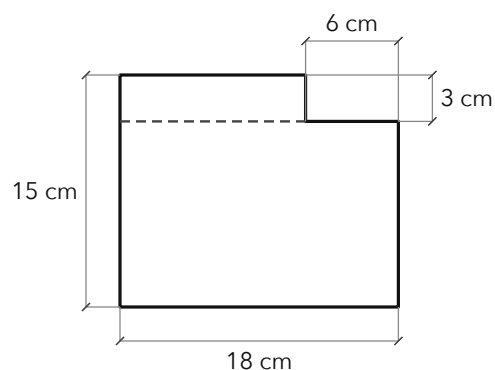
Find the total area of the trapezoid and rectangle.

$$336 \text{ cm}^2$$

**PRACTICE 4**

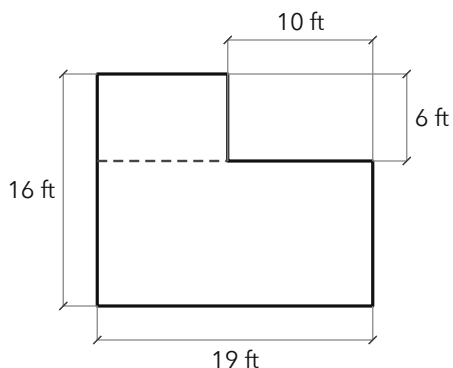
Find the perimeter of the rectangle with a corner removed.

$$66 \text{ cm}$$



APPLY IT 1

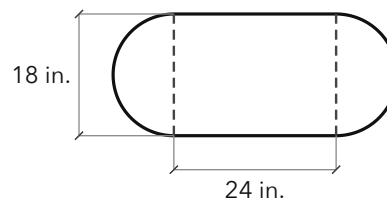
244 ft² Subtract the 10 ft by 6 ft missing rectangle from the 19 ft by 16 ft outer rectangle:
 $304 - 60 = 244$.



APPLY IT 2

Area = $432 + 81\pi$ in²; border = $48 + 18\pi$ in

The two semicircles form one circle with radius 9 in. Add its area to the rectangle, and add its circumference to the two 24 in sides.



CHALLENGE

Area = 432 cm²; perimeter = 112 cm. I subtracted the 12 cm by 9 cm notch from the 27 cm by 20 cm rectangle.

Accept equivalent forms with factors in a different order. For the challenge explanation, accept any correct subtraction or subdivision method. Dashed lines in the teacher diagrams show one valid partition. Accept other valid non-overlapping partitions with correct calculations. Outside measurement lines show horizontal or vertical distances; they are not extra sides of the shape.

