LESSON MAKER PRO

Shape Space

Find area and perimeter in plans and designs.

HIGH SCHOOL · G.2D.1.7

G.2D.1.7 "Apply the properties of polygons, and use them to represent and apply mathematical models involving perimeter and area (e.g., triangles, special quadrilaterals, regular polygons up to 12 sides, composite figures)."

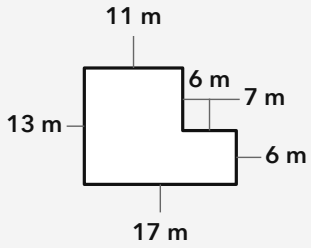
NAME _____ DATE _____

BREAK IT APART

To find the area of a composite polygon, add the areas of its parts or subtract a missing part from a larger shape. To find its perimeter, add the lengths along its outside edge, including edges around a cutout.

WORKED EXAMPLE

Find the area and perimeter of the floor plan shown.

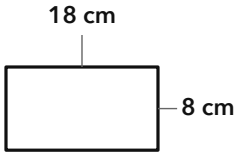


1. Area of the full rectangle: $17 \times 13 = 221$ m^2.
2. Area of the missing corner: $6 \times 7 = 42$ m^2.
3. Floor area: $221 - 42 = 179$ m^2.
4. Perimeter: $17 + 6 + 6 + 7 + 11 + 13 = 60$ m.

Answer: Area: 179 m^2; perimeter: 60 m.

PRACTICE 6 problems

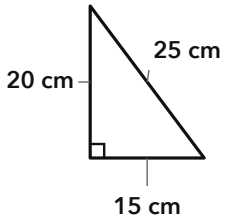
1 Find the area and perimeter of the rectangle shown.



ANSWER _____

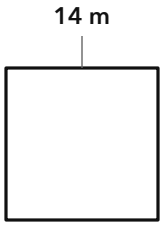
_____

2 Find the area of the right triangle shown.



ANSWER _____

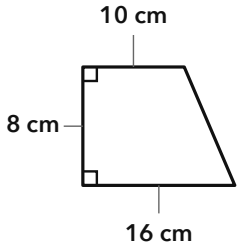
3 Find the area and perimeter of the square shown.



ANSWER _____

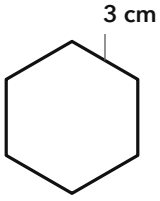
_____

4 Find the area of the right trapezoid shown.



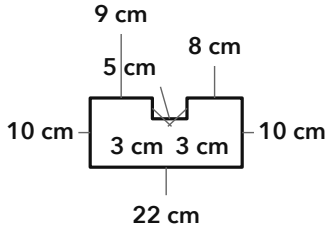
ANSWER _____

5 The hexagon shown is regular. Find its perimeter.



ANSWER _____

6 Find the area and perimeter of the shape with a notch shown.

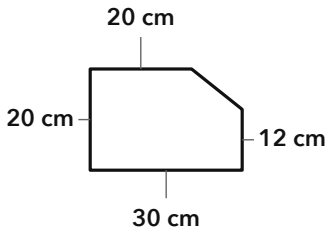


ANSWER _____

_____

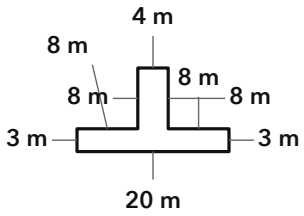
APPLY IT Show your work

1 A student prints the banner shape shown for a music event. Printing costs \$0.05 per cm^2. What is the total printing cost?



ANSWER _____

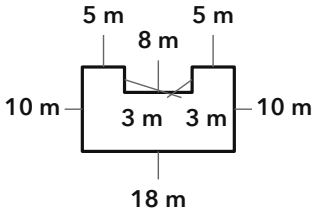
2 A skate park plans railing along the outside edge of the viewing deck shown. Railing costs \$3 per meter. What is the total cost?



ANSWER _____

CHALLENGE One step up

The garden shown was a rectangle before a notch was cut from its top edge. How many meters greater is its perimeter now? Explain why the notch's width does not affect the increase.



WORK SPACE AND ANSWER

Shape Space

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the area and perimeter of the rectangle shown.	**Area: 144 cm^2; perimeter: 52 cm.**
2	Find the area of the right triangle shown.	**150 cm^2**
3	Find the area and perimeter of the square shown.	**Area: 196 m^2; perimeter: 56 m.**
4	Find the area of the right trapezoid shown.	**104 cm^2**
5	The hexagon shown is regular. Find its perimeter.	**18 cm**
6	Find the area and perimeter of the shape with a notch shown.	**Area: 205 cm^2; perimeter: 70 cm.**

PART 2 · APPLY IT

1. **$28** The trimmed corner is a right triangle with legs of 10 cm and 8 cm. The banner area is 30 × 20 − (10 × 8)/2 = 560 cm^2, so printing costs 560 × $0.05 = $28.
2. **$186** The deck's perimeter is 20 + 3 + 8 + 8 + 4 + 8 + 8 + 3 = 62 m. The railing costs 62 × $3 = $186.

CHALLENGE

6 m greater. The 8 m removed from the top edge is replaced by an 8 m edge inside the notch. Only the two 3 m sides increase the perimeter.

Accept equivalent calculations with correct units. In the challenge, accept any explanation that pairs the removed edge with the equal-length edge inside the notch.