

Shape Area Quest

Build, split, and measure plane figures.

GRADE 6 • 6.GSR.5.1

6.GSR.5.1 "Explore area as a measurable attribute of triangles, quadrilaterals, and other polygons conceptually by composing or decomposing into rectangles, triangles, and other shapes. Find the area of these geometric figures to solve problems."

NAME _____

DATE _____

BUILD AREA FROM PIECES

Split a polygon into rectangles and triangles, or place it inside a larger rectangle and subtract a missing part. Use base $\times$ height for rectangles and parallelograms, base $\times$ height $\div 2$ for triangles, and (sum of the parallel bases) $\times$ height $\div 2$ for trapezoids. Add the areas of pieces that are part of the figure, and subtract areas of cutouts.

WORKED EXAMPLE

An L-shaped patio fits inside a 7-unit by 6-unit rectangle. A 2-unit by 3-unit corner is missing. Find the area.

1. Find the large rectangle: $7 \times 6 = 42$ square units.
2. Find the missing corner: $2 \times 3 = 6$ square units.
3. Subtract the cutout: $42 - 6 = 36$ square units.

Answer: 36 square units

PRACTICE 6 problems

- 1** Find the area of a triangle with a base of 10 units and a height of 8 units.

ANSWER _____

- 2** Find the area of a parallelogram with a base of 9 units and a perpendicular height of 5 units.

ANSWER _____

- 3** Find the area of a rectangle that is 11 units long and 4 units wide.

ANSWER _____

- 4** Find the area of a trapezoid with parallel bases of 12 units and 16 units and a height of 5 units.

ANSWER _____

- 5** An L-shaped figure fits inside a 15-unit by 9-unit rectangle. A 4-unit by 5-unit corner is cut out. Find the area of the L-shaped figure.

ANSWER _____

- 6** A house-shaped pentagon is split into a 13-unit by 8-unit rectangle and a triangle with a base of 13 units and a height of 4 units. Find the total area.

ANSWER _____

APPLY IT Show your work

- 1** The gaming club is making a triangular banner for a tournament. The banner has a base of 18 inches and a height of 10 inches. How much fabric is needed to make the banner?

WORK SPACE

ANSWER _____

- 2** A skate park mural will cover an L-shaped wall. The wall fits inside a 22-foot by 15-foot rectangle, but a 5-foot by 9-foot doorway will not be painted. What area will be painted?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A stage backdrop is made from an 18-unit by 13-unit rectangle with a triangle on top. The triangle has a base of 18 units and a height of 11 units. A 4-unit by 5-unit rectangular window is cut out of the backdrop. What is the area of the backdrop that remains?

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the area of a triangle with a base of 10 units and a height of 8 units.	40 square units
2	Find the area of a parallelogram with a base of 9 units and a perpendicular height of 5 units.	45 square units
3	Find the area of a rectangle that is 11 units long and 4 units wide.	44 square units
4	Find the area of a trapezoid with parallel bases of 12 units and 16 units and a height of 5 units.	70 square units
5	An L-shaped figure fits inside a 15-unit by 9-unit rectangle. A 4-unit by 5-unit corner is cut out. Find the area of the L-shaped figure.	115 square units
6	A house-shaped pentagon is split into a 13-unit by 8-unit rectangle and a triangle with a base of 13 units and a height of 4 units. Find the total area.	130 square units

PART 2 • APPLY IT

- 90 square inches** Use the triangle area rule: $18 \times 10 / 2 = 90$. The banner needs 90 square inches of fabric.
- 285 square feet** Find the large rectangle area, $22 \times 15 = 330$, then subtract the doorway area, $5 \times 9 = 45$. The painted area is $330 - 45 = 285$ square feet.

CHALLENGE

313 square units

Accept correct equivalent calculations and area labels such as square units, square inches, or square feet. For composite figures, accept any valid decomposition that leads to the stated area.