

# Shape Area Lab

*Build complex shapes from simple parts.*

**GRADE 6 • 6.G.A.1**

**CCSS.Math.Content.6.G.A.1** "Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes..."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## SPLIT AND ADD

Break a complex shape into rectangles and triangles whose areas you can find. Add the areas of pieces that are included, and subtract the areas of pieces that are cut out.

## WORKED EXAMPLE

A trapezoid has parallel bases of 11 cm and 17 cm and a height of 8 cm. Find its area.

1. Add the base lengths:  $11 + 17 = 28$ .
2. Multiply by the height:  $28 \times 8 = 224$ .
3. Take half:  $224 / 2 = 112$ .

**Answer:  $112 \text{ cm}^2$**

## PRACTICE 6 problems

- 1** A right triangle has a base of 9 m and a height of 6 m. Find its area.

**ANSWER** \_\_\_\_\_

- 2** A triangle has a base of 14 in. and a perpendicular height of 3 in. Find its area.

**ANSWER** \_\_\_\_\_

- 3** A parallelogram has a base of 12 cm and a height of 4 cm. Find its area.

**ANSWER** \_\_\_\_\_

- 4** A trapezoid has parallel bases of 10 yd and 16 yd. Its height is 9 yd. Find its area.

**ANSWER** \_\_\_\_\_

- 5** An L-shaped floor fits inside a 15 ft by 12 ft rectangle. A 6 ft by 4 ft corner is cut out. Find the area of the L-shaped floor.

**ANSWER** \_\_\_\_\_

- 6** A pentagon is made from an 18 cm by 10 cm rectangle with a triangle attached along an 18 cm side. The triangle has a base of 18 cm and a height of 6 cm. Find the area of the pentagon.

**ANSWER** \_\_\_\_\_

## APPLY IT Show your work

- 1** The student council is making a trapezoid-shaped photo backdrop for a school dance. Its parallel sides are 20 ft and 14 ft, and its height is 9 ft. How many square feet of fabric are needed to cover the backdrop?

WORK SPACE

ANSWER \_\_\_\_\_

- 2** A school esports club is covering an L-shaped booth wall with panels. The wall fits inside a 24 ft by 16 ft rectangle, but a 9 ft by 6 ft rectangular doorway takes up one corner. How many square feet of wall will be covered?

WORK SPACE

ANSWER \_\_\_\_\_

## CHALLENGE One step up

### CHALLENGE

A polygon is made by starting with a 25 cm by 19 cm rectangle. A right triangle with a base of 10 cm and a height of 9 cm is cut from one corner. A 7 cm by 4 cm rectangular notch is cut from a different corner. Find the area of the remaining polygon.

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## PART 1 • PRACTICE

| # | PROBLEM                                                                                                                                                                                 | ANSWER                    |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 1 | A right triangle has a base of 9 m and a height of 6 m. Find its area.                                                                                                                  | <b>27 m<sup>2</sup></b>   |
| 2 | A triangle has a base of 14 in. and a perpendicular height of 3 in. Find its area.                                                                                                      | <b>21 in.<sup>2</sup></b> |
| 3 | A parallelogram has a base of 12 cm and a height of 4 cm. Find its area.                                                                                                                | <b>48 cm<sup>2</sup></b>  |
| 4 | A trapezoid has parallel bases of 10 yd and 16 yd. Its height is 9 yd. Find its area.                                                                                                   | <b>117 yd<sup>2</sup></b> |
| 5 | An L-shaped floor fits inside a 15 ft by 12 ft rectangle. A 6 ft by 4 ft corner is cut out. Find the area of the L-shaped floor.                                                        | <b>156 ft<sup>2</sup></b> |
| 6 | A pentagon is made from an 18 cm by 10 cm rectangle with a triangle attached along an 18 cm side. The triangle has a base of 18 cm and a height of 6 cm. Find the area of the pentagon. | <b>234 cm<sup>2</sup></b> |

## PART 2 • APPLY IT

- 153 ft<sup>2</sup>** Add the parallel sides, multiply by the height, and divide by 2:  $(20 + 14) \times 9 / 2 = 153$ .
- 330 ft<sup>2</sup>** Find the area of the outer rectangle, then subtract the doorway:  $24 \times 16 - 9 \times 6 = 330$ .

## CHALLENGE

**402 cm<sup>2</sup>**

Accept correct equivalent methods, including adding component areas or subtracting cutout areas. Units should be square units.