LESSON MAKER PRO

Shape Area Switch

Cut, slide, and calculate area.

GRADE 6 · TEKS 6.8.B

6.8.B "model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes;"

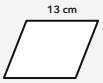
NAME _____ DATE _____

BUILD THE FORMULA

Cut a parallelogram along its height and slide the small triangle to the other side. It makes a rectangle, so its area is A = b × h. A triangle is half of that rectangle, and a trapezoid can be rearranged to use the average of its two parallel bases: A = $(b_1 + b_2) \times h / 2$.

WORKED EXAMPLE

Find the area of the parallelogram in the figure. Its perpendicular height is 8 cm.

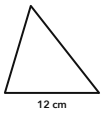


1. Use A = b × h.
2. A = 13 × 8.
3. A = 104 cm^2.

Answer: 104 cm^2

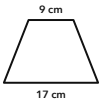
PRACTICE 6 problems

1 Find the area of the triangle in the figure. Its perpendicular height is 7 cm.



ANSWER _____

2 Find the area of the trapezoid in the figure. Its perpendicular height is 6 cm.



ANSWER _____

3 A parallelogram has a base of 15 cm and a perpendicular height of 9 cm. After moving a cut-off corner triangle, it forms a rectangle. What is the area of the rectangle and the parallelogram?

ANSWER _____

4 A triangle has a base of 18 m and a perpendicular height of 11 m. Find its area.

ANSWER _____

5 A trapezoid has parallel bases of 14 in. and 22 in. Its height is 10 in. Find its area.

ANSWER _____

6 A triangle has an area of 72 cm^2 and a base of 16 cm. What is its perpendicular height?

ANSWER _____

APPLY IT Show your work

1 Jalen is covering a parallelogram-shaped skateboard deck graphic. The graphic has a base of 26 cm and a perpendicular height of 11 cm. He cuts off one corner triangle and slides it to make a rectangle. What area will the graphic cover?

WORK SPACE

ANSWER _____

2 A community garden has a trapezoid-shaped pollinator bed. Its parallel sides are 19 m and 31 m, and its height is 14 m. How many square meters of soil will cover the bed?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A parallelogram has a base of 21 cm and a perpendicular height of 16 cm. A diagonal cuts it into two triangles. Find the area of each triangle. Explain why the two areas are equal.

WORK SPACE AND ANSWER

ANSWER KEY

Shape Area Switch

GRADE 6 · TEKS 6.8.B

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the area of the triangle in the figure. Its perpendicular height is 7 cm.	**42 cm^2**
2	Find the area of the trapezoid in the figure. Its perpendicular height is 6 cm.	**78 cm^2**
3	A parallelogram has a base of 15 cm and a perpendicular height of 9 cm. After moving a cut-off corner triangle, it forms a rectangle. What is the area of the rectangle and the parallelogram?	**135 cm^2 for both the rectangle and the parallelogram**
4	A triangle has a base of 18 m and a perpendicular height of 11 m. Find its area.	**99 m^2**
5	A trapezoid has parallel bases of 14 in. and 22 in. Its height is 10 in. Find its area.	**180 $in.^2$**
6	A triangle has an area of 72 cm^2 and a base of 16 cm. What is its perpendicular height?	**9 cm**

PART 2 · APPLY IT

1. **286 cm^2** The rearranged shape is a 26 cm by 11 cm rectangle. Multiply 26 × 11 to get 286 cm^2.
2. **350 m^2** Average the parallel bases: (19 + 31) / 2 = 25. Multiply 25 × 14 to get 350 m^2.

CHALLENGE

168 cm^2 each; the parallelogram has area 21 × 16 = 336 cm^2, and a diagonal divides a parallelogram into two equal-area triangles, so 336 / 2 = 168 cm^2.

Accept equivalent formulas and correct area units. For the challenge, accept an explanation that a diagonal creates two congruent triangles or two triangles with equal area.