LESSON MAKER PRO

Shape Space

Find area, surface area, and volume.

GRADE 7 · 7.G.6

7.G.6 "Solve real-world and mathematical problems involving: Area and surface area of objects composed of triangles and quadrilaterals; Volume of objects composed only of right prisms having triangular or quadrilateral bases."

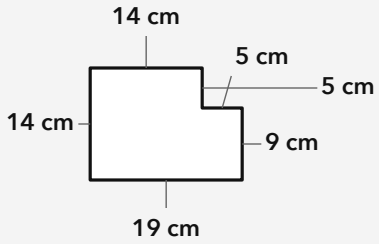
NAME _____ DATE _____

SPLIT, THEN CALCULATE

Split a flat shape into rectangles or triangles, then add their areas without counting any part twice. To find a right prism's volume, multiply its base area by its length. To find surface area, add the areas of all its outside faces.

WORKED EXAMPLE

Find the area of the pictured shape.

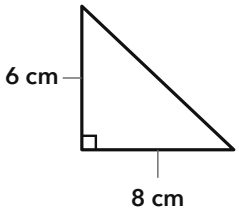


1. Split the shape into a bottom rectangle and a top rectangle.
2. Bottom area: $19 \times 9 = 171$ cm^2.
3. Top area: $14 \times 5 = 70$ cm^2.
4. Add: $171 + 70 = 241$ cm^2.

Answer: 241 cm^2

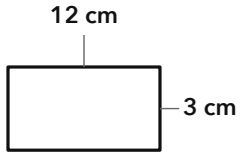
PRACTICE 6 problems

1 Find the area of the triangle.



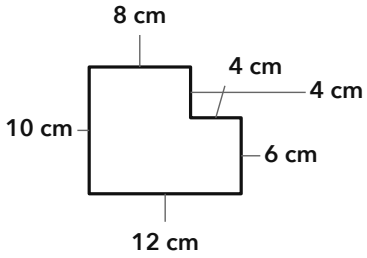
ANSWER _____

2 Find the area of the rectangle.



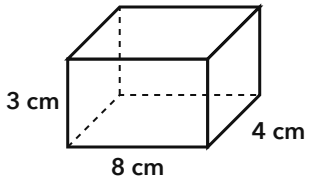
ANSWER _____

3 Find the area of the pictured shape.



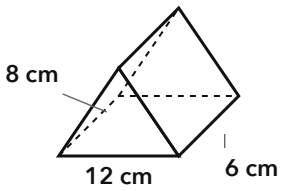
ANSWER _____

4 Find the total surface area of the rectangular prism.



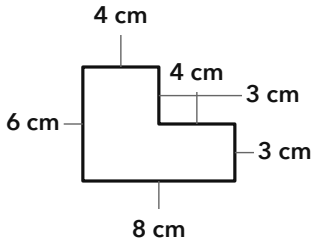
ANSWER _____

5 Find the volume of the triangular prism.



ANSWER _____

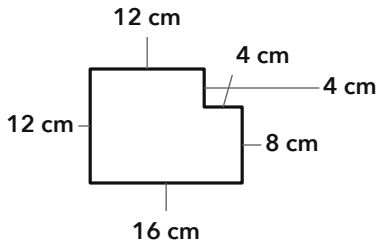
6 The pictured shape is the base of a right prism. The prism is 6 cm long. Find its volume.



ANSWER _____

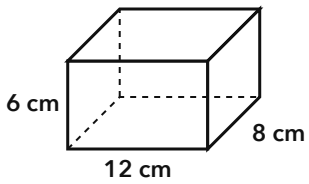
APPLY IT Show your work

1 A desk mat has the shape shown. How many square centimeters of fabric cover its top?



ANSWER _____

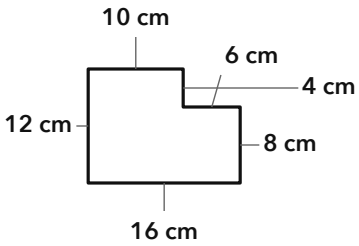
2 A student makes a closed box for trading cards with the dimensions shown. What is the least area of cardboard needed, ignoring folds and overlaps?



ANSWER _____

CHALLENGE One step up

The pictured shape is the base of a right prism that is 3 cm long. Find the total surface area, including both bases. Show how you know.



WORK SPACE AND ANSWER

Shape Space

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the area of the triangle.	**24 cm^2**
2	Find the area of the rectangle.	**36 cm^2**
3	Find the area of the pictured shape.	**104 cm^2**
4	Find the total surface area of the rectangular prism.	**136 cm^2**
5	Find the volume of the triangular prism.	**288 cm^3**
6	The pictured shape is the base of a right prism. The prism is 6 cm long. Find its volume.	**216 cm^3**

PART 2 · APPLY IT

1. **176 cm^2** Split the mat into rectangles with areas 16 × 8 and 12 × 4. Their total area is 128 + 48 = 176 cm^2.
2. **432 cm^2** The six faces form three pairs of equal rectangles. Their total area is 2(12 × 8 + 12 × 6 + 8 × 6) = 432 cm^2.

CHALLENGE

504 cm^2. Each base has area 16 × 8 + 10 × 4 = 168 cm^2. The base perimeter is 56 cm, so the side faces total 56 × 3 = 168 cm^2. Thus, 2(168) + 168 = 504 cm^2.

Accept any correct way to split a composite shape into nonoverlapping parts. For the challenge, students may add the side faces separately instead of using the base perimeter.