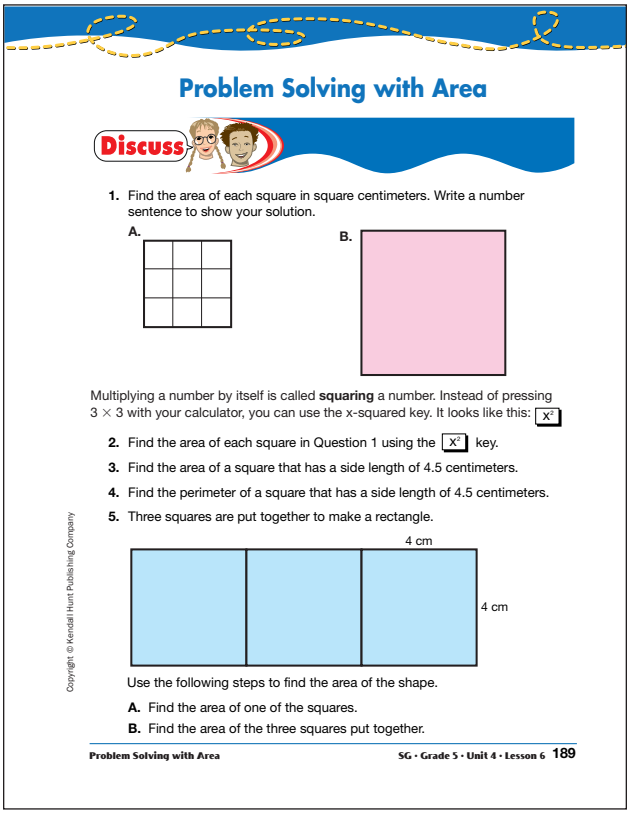
Student Guide

Problem Solving with Area (SG pp. 189–194) Questions 1–17

1. **A.*** 9 sq cm; 3 cm × 3 cm = 9 sq cm
   B.* 25 sq centimeters; 5 cm × 5 cm = 25 sq cm
2. 9 sq cm; 25 sq cm
3. *20.25 sq cm
4. 18 cm
5. **A.*** 16 sq cm
   B.* 48 sq cm
6. **A.*** 100 sq cm
   B.* 10 cm
7. * 120 cm



Problem Solving with Area

Discuss

1. Find the area of each square in square centimeters. Write a number sentence to show your solution.

A.

B.

Multiplying a number by itself is called **squaring** a number. Instead of pressing 3 × 3 with your calculator, you can use the x-squared key. It looks like this: x^2

2. Find the area of each square in Question 1 using the x^2 key.
3. Find the area of a square that has a side length of 4.5 centimeters.
4. Find the perimeter of a square that has a side length of 4.5 centimeters.
5. Three squares are put together to make a rectangle.

Use the following steps to find the area of the shape.

A. Find the area of one of the squares.
B. Find the area of the three squares put together.

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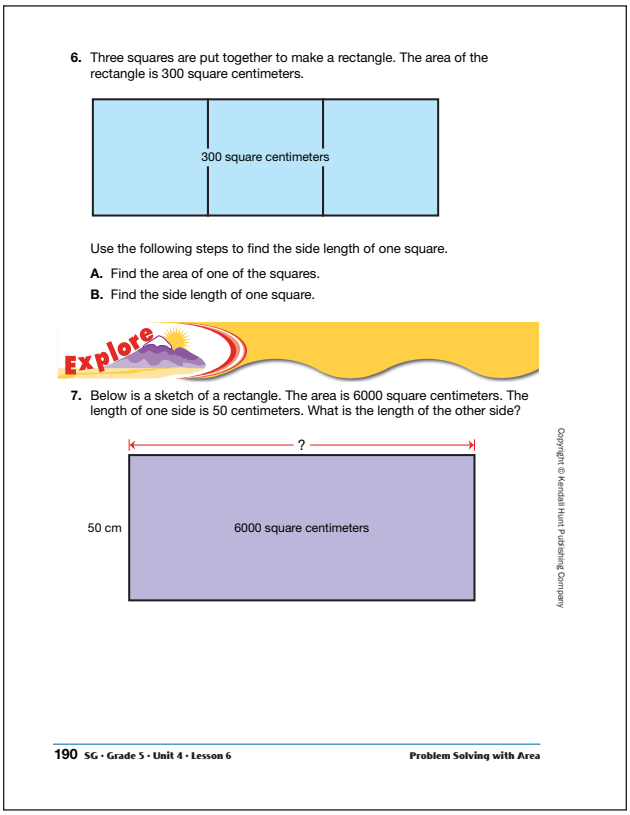

6. Three squares are put together to make a rectangle. The area of the rectangle is 300 square centimeters.

Use the following steps to find the side length of one square.

A. Find the area of one of the squares.
B. Find the side length of one square.

Explore

7. Below is a sketch of a rectangle. The area is 6000 square centimeters. The length of one side is 50 centimeters. What is the length of the other side?

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***Answers and/or discussion are included in the lesson.**

In Questions 8–11, a rectangle is described. Some are possible and some are crazy. If a problem is possible, find the solution. If it is crazy, explain why.

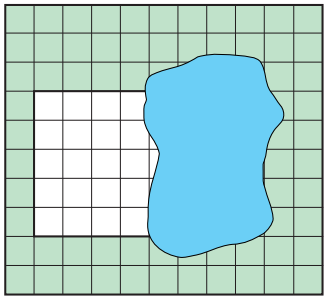
8. A square has an area of 36 centimeters. What is the perimeter?

9. A square has a perimeter of 20 centimeters. What is the area?

10. Three sides of a rectangle are 19 cm, 7 cm, and 18 cm. Find the area and perimeter of the rectangle.

11. Two sides of a rectangle are 7.6 centimeters and 7.5 centimeters. Calculate the area and perimeter of the rectangle.

12. Below is a green rectangle with a white rectangular hole. The area of the shaded part is 80 square centimeters. The white rectangle is 5 centimeters long, but someone spilled on the paper so you can't see its width.



Use the following steps to find the width of the white rectangle.

A. Find the area of the large rectangle.

B. Find the area of the white rectangle.

C. What is the length of the white rectangle?

D. Find the width of the white rectangle.

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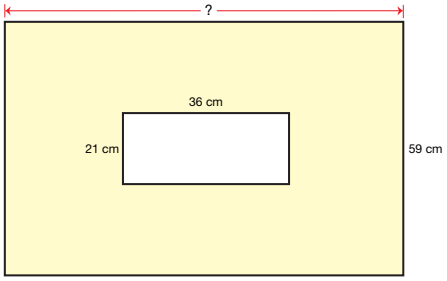
13. The shaded area in the sketch below is 4,554 square centimeters.



Use the following steps to find the width of the large rectangle.

A. Find the area of the white rectangle.

B. Find the area of the large rectangle.

C. Find the width of the large rectangle.

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8. 24 cm

9. 25 sq cm

10.* This is not possible; a rectangle has 4 sides and opposite sides are the same length. There can't be three different side lengths.

11. The area is 57 sq cm; The perimeter is 30.2 cm

12. A. 110 sq cm

B. 30 sq cm

C. 5 cm

D. 6 cm

13. A. 756 sq cm

B. 5310 sq cm

C. 90 cm

14.* Possible response: First I found the area of the horizontal rectangle:

272 cm × 68 cm = 18,496 square cm. Then I found the area of the top rectangle: 102 cm × 68 cm = 6936 square cm. Since there are two smaller rectangles, one on top and one on bottom, I doubled 6936 to get 13,872 square cm. 18,496 + 13,872 = 32,368 sq cm.

***Answers and/or discussion are included in the lesson.**

15.* Possible response: I do not agree with Levi. One of the rectangles is 272 cm × 68 cm. But Levi counted the middle part of the shape twice—once for the horizontal rectangle and once for the vertical rectangle, so his area will be too large.

16.* The area of the pentagon is 79 square centimeters. Possible response: First I found the area of each section of the figure.

The rectangle is 10 centimeters long and 4 centimeters wide so the area is 40 square centimeters.

To find the area of each triangle I drew in the lines to make each one into a rectangle. Once I found the area of each rectangle, I knew the area of the triangle would be half.

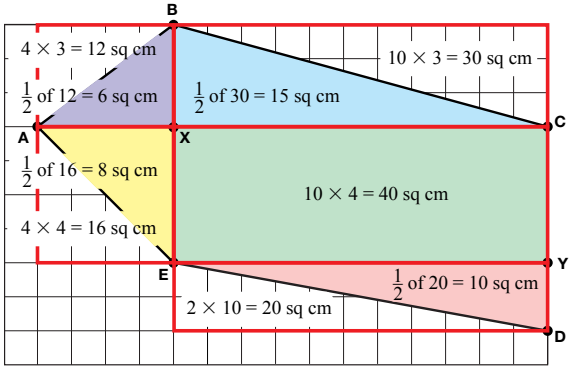
Triangle BXA has an area of 6 square centimeters.

Triangle BXC has an area of 15 square centimeters.

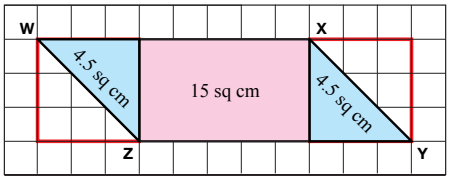
Triangle AXE has an area of 8 square centimeters.

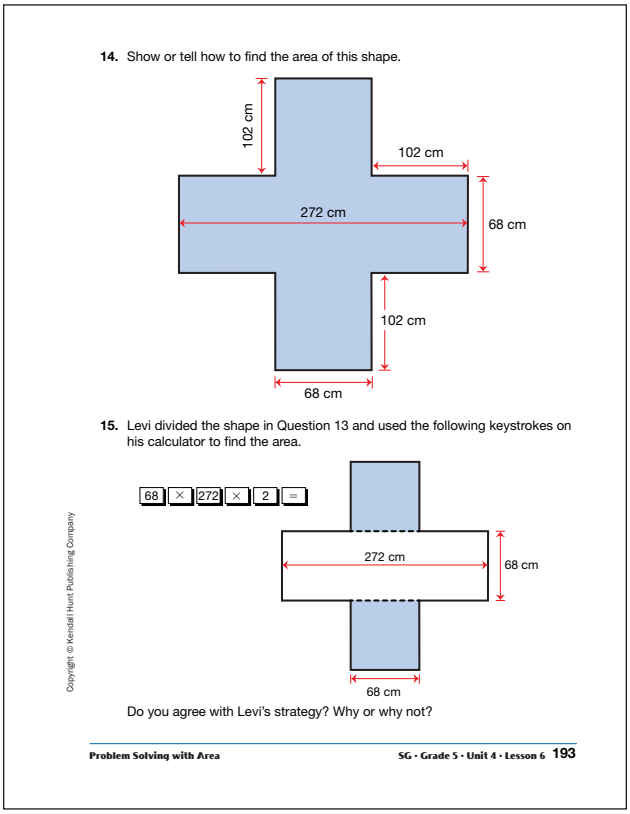
Triangle DYE has an area of 10 square centimeters.

Finally I added all the areas together: 40 + 15 + 6 + 8 + 10 = 79 square centimeters.



17. 24 square centimeter




14. Show or tell how to find the area of this shape.

15. Levi divided the shape in Question 13 and used the following keystrokes on his calculator to find the area.

68 × 272 × 2 =

Do you agree with Levi's strategy? Why or why not?

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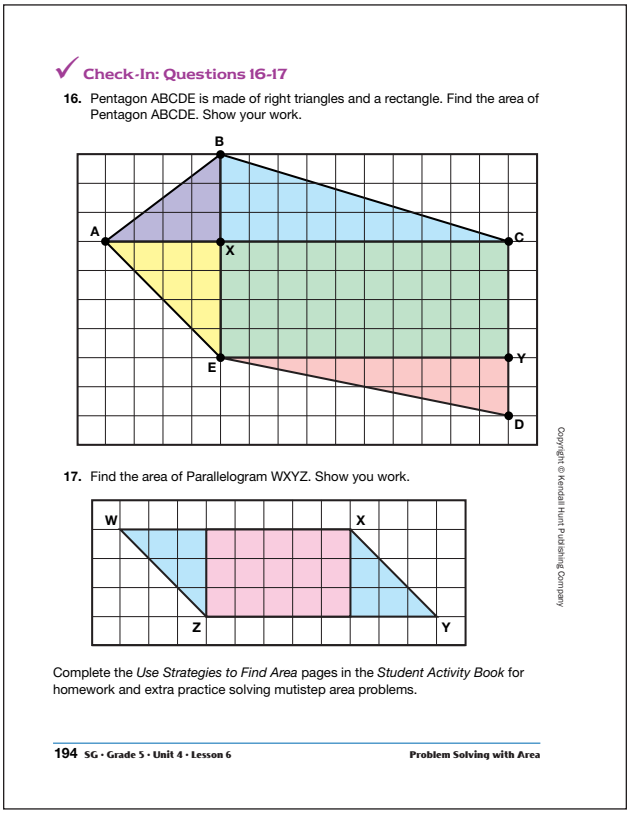
✓ Check-In: Questions 16-17

16. Pentagon ABCDE is made of right triangles and a rectangle. Find the area of Pentagon ABCDE. Show your work.

17. Find the area of Parallelogram WXYZ. Show you work.

Complete the *Use Strategies to Find Area* pages in the *Student Activity Book* for homework and extra practice solving mutistep area problems.

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***Answers and/or discussion are included in the lesson.**