Name_____ Date _____

4.3 Areas of Trapezoids
For use with Activity 4.3

Essential Question How can you derive a formula for the area of a trapezoid?

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1 **ACTIVITY:** Deriving the Area Formula of a Trapezoid

Work with a partner. Use a piece of centimeter grid paper.

a. Draw *any* trapezoid so that its base lies on one of the horizontal lines of the paper.

b. Estimate the area of your trapezoid (in square centimeters) by counting unit squares.

  Area ≈ _____ Estimate

c. Label the height and the bases *inside* the trapezoid.

d. Cut out the trapezoid. Mark the midpoint of the side opposite the height. Draw a line from the midpoint to the opposite upper vertex.

e. Cut along the line. You will end up with a triangle and a quadrilateral. Arrange these two figures to form a figure whose area you know.
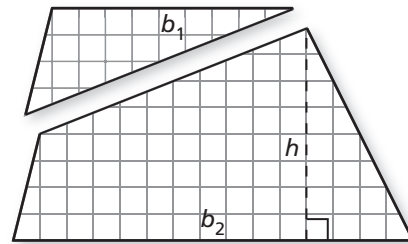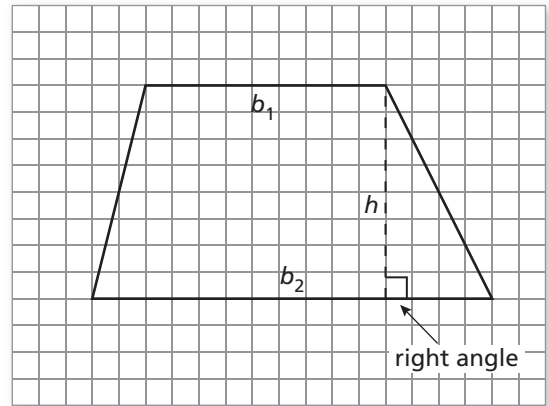
f. Use your result to write a *formula* for the area of a trapezoid.

  Area = _____ Formula

g. Use your formula to find the area of your trapezoid (in square centimeters).

  Area = _____ Exact Area

h. Compare this area with your estimate in part (b).

4.3 **Areas of Trapezoids (continued)**

2 **ACTIVITY:** Writing a Math Lesson

Work with a partner. Use your results from Activity 1 to write a lesson on finding the area of a trapezoid.

Area of a Trapezoid

Key Idea Use the following steps to find the area of a trapezoid.

1.

2.

3.

Describe steps you can use to find the area of a trapezoid.

Examples Write 2 examples for finding the area of a trapezoid. Include a drawing for each.

a.   b.

Exercises Write 2 exercises for finding the area of a trapezoid. Include an answer sheet.
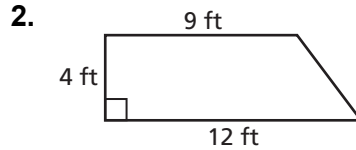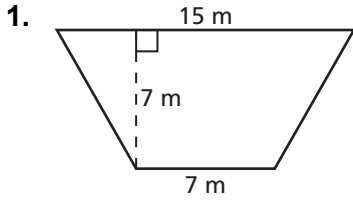
Find the area.

1.   2.

4.3 **Areas of Trapezoids** (continued)

What Is Your Answer?

3. **IN YOUR OWN WORDS** How can you derive a formula for the area of a trapezoid?

4. In this chapter, you used deductive reasoning to derive new area formulas from area formulas you have already learned. Describe a real-life career in which deductive reasoning is important.

Name _____ Date _____

Find the area of the trapezoid.

1.

15 m

7 m

7 m

2.

9 ft

4 ft

12 ft

Find the area of the trapezoid with height _h_ and bases b_1 and b_2.

3. $h = 10$ yd

$b_1 = 17$ yd

$b_2 = 21$ yd

4. $h = 9$ cm

$b_1 = 4.5$ cm

$b_2 = 5.5$ cm

5. The triangle and the trapezoid have the same area. Base b_2 is twice the length of base b_1. What are the lengths of the bases of the trapezoid?
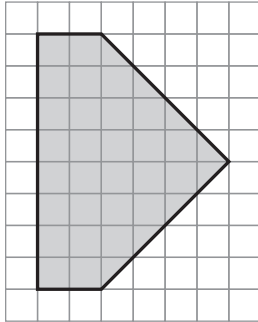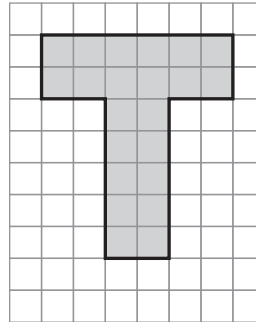
6 cm

21 cm

b_1

6 cm

b_2

Name_____ Date _____
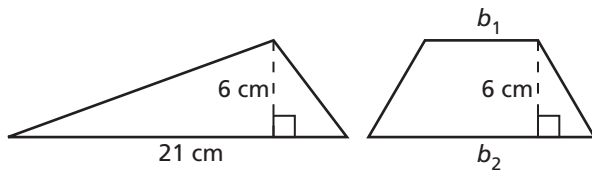
Extension 4.3 Practice
For use after Extension 4.3

Find the area of the shaded figure.

1.

2.

3.
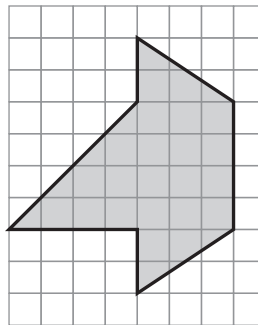
4.
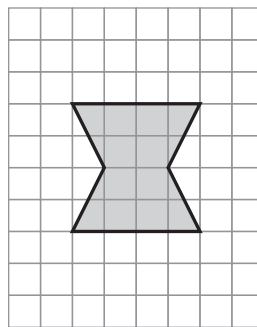
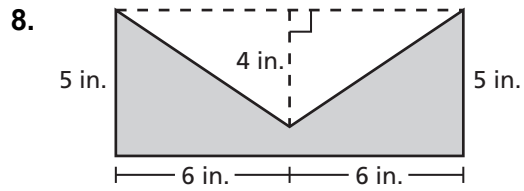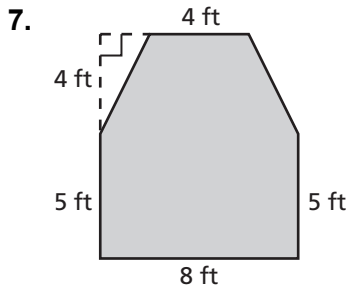**Extension 4.3** **Practice** (continued)

Find the area of the figure.

5.

8 cm

4 cm

4 cm

6.

2 m

6 m

2 m

8 m

7.

4 ft

4 ft

5 ft   5 ft

8 ft

8.

5 in.   4 in.   5 in.

6 in.   6 in.
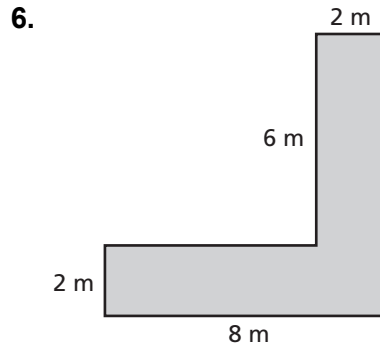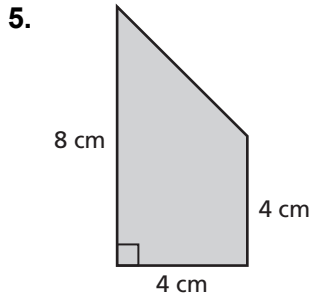
9. You add a 4-foot-by-4-foot section of land to a 6-foot-by-8-foot garden. Find the area of the new garden.