

**Launch:** Assuming our classroom floor is rectangular in shape, determine the following if each floor tile is a square that is 1 foot long by 1 foot wide. Use the correct units for each.

Estimated Length of Classroom \_\_\_\_\_ Estimated Width of Classroom \_\_\_\_\_

Estimated Perimeter of Classroom floor \_\_\_\_\_ Estimated Area of Classroom floor \_\_\_\_\_

Did you use the same units for both Perimeter and Area? Explain.

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## Areas of Triangles and Special Quadrilaterals

### Learning Targets

- a) I can apply the area formula(s) of RECTANGLES to solve problems.
- b) I can apply the area formula(s) of PARALLELOGRAMS to solve problems.

**Please pick up a handout and a piece  
of graph paper**



## Areas of Triangles and Special Quadrilaterals

### Vocabulary

- **Perimeter** is the length of the boundary of a two-dimensional closed figure.
- **Area** is the measure of the size of the interior of a figure.

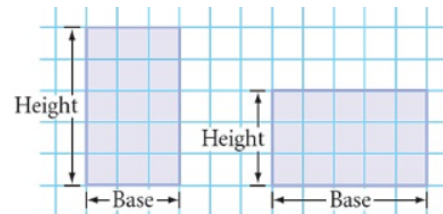
Discovering Geometry  
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Lesson 8.1 Areas of Triangles and Special Quadrilaterals

### Area of a Rectangle

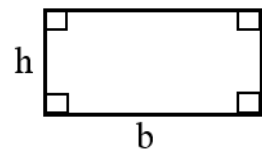
Any side of a rectangle can be called a base. A rectangle's height is the length of the side that is perpendicular to the Base.

We can find area by simply counting the number of squares that form the rectangle, but since the squares are arranged in rows and columns, we can use the formula:

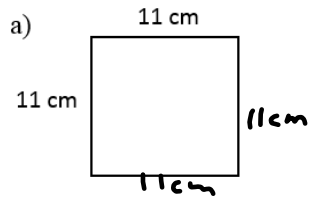


$$\text{Area}_{\text{rectangle}} = bh$$

where  $b$  is the base, and  $h$  is the height of the rectangle

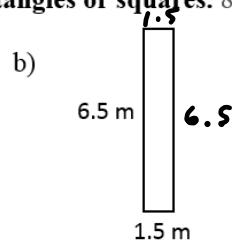


1. Find the area and perimeter of the rectangles or squares. 8.1a



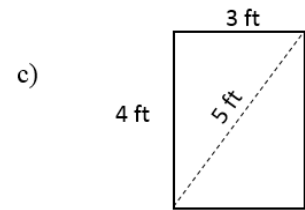
$$A = \underline{121 \text{ cm}^2}$$

$$P = \underline{44 \text{ cm}}$$



$$A = \underline{9.75 \text{ m}^2}$$

$$P = \underline{16 \text{ m}}$$



$$A = \underline{12 \text{ ft}^2}$$

$$P = \underline{14 \text{ ft}}$$

2. The base of a rectangle is 15 feet long. The area of the rectangle is 195 square feet. What is the perimeter of the rectangle? 8.1a

$$\text{Perimeter} = \frac{56 \text{ ft}}{13 + 15 + 13 + 15}$$

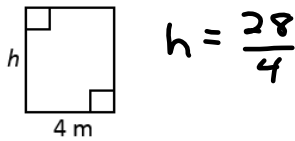
$$h \begin{array}{|c|} \hline 195 \text{ ft}^2 \\ \hline \end{array} \begin{array}{l} 13 \text{ ft} \\ 15 \text{ ft} \end{array}$$

$$15h = 195$$

$$h = 13$$

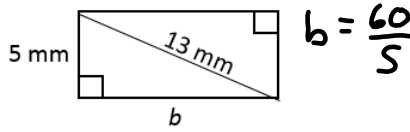
3. Find the missing dimension and perimeter using the given information. 8.1a

a) Rectangle Area =  $28 \text{ m}^2$



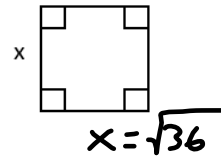
$h = \frac{7 \text{ m}}{}$   
 $P = \frac{22 \text{ m}}{}$

b) Rectangle Area =  $60 \text{ mm}^2$



$b = \frac{12 \text{ mm}}{}$   
 $P = \frac{34 \text{ mm}}{}$

c) Square Area =  $36 \text{ mi}^2$



$x = \frac{6 \text{ mi}}{}$   
 $P = \frac{24 \text{ mi}}{}$

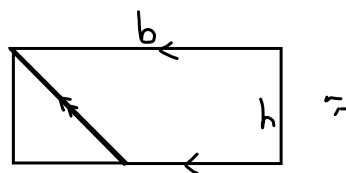
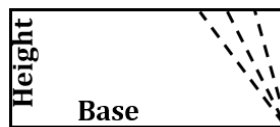
A **Parallelogram** is a quadrilateral with two pairs of opposite sides that are parallel. **Rectangles** and **Squares** are examples of special case parallelograms.

**Task:**

**Step 1:** Using graph paper, draw and cut any size rectangle. Your sides should be lined up with the gridlines to ensure that (1) the opposite sides are parallel and (2) all interior angles are right angles.

**Step 2:** Label the sides “Base” and “Height” as shown.

Write the Area of your Rectangle here \_\_\_\_\_



**Step 3:** Using a straight edge, draw a segment connecting the *bottom right corner* of your rectangle to a point at the top edge of your rectangle where there is a gridline.

What is the slope of the segment you drew? \_\_\_\_\_

**Step 4:** Cut along the segment you drew and separate the right triangle from your original rectangle. Keeping the other piece in place, pick up your triangle and translate/shift it to the left, without rotating, until its vertical side is flush with the other side.

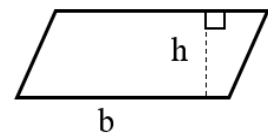
What kind of shape is this? \_\_\_\_\_

Write the Area of your new quadrilateral here \_\_\_\_\_

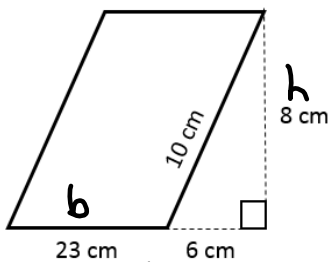
**Observe the height and base of the parallelogram. How can you determine the Area without counting squares?**

$$Area_{parallelogram} = \underline{bh}$$

where  $b$  is the base, and  $h$  is the height of the parallelogram

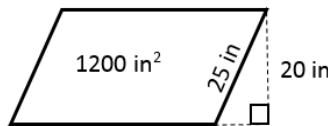


4. Find the Area 8.1b



$A = 23 \cdot 8$   
 $A = \underline{184 \text{ cm}^2}$

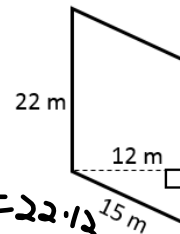
5. Find the base 8.1b



$b \quad 20b = 1200$   
 $b = 60$

$b = \underline{60 \text{ in}}$

6. Find the Area 8.1b



$A = 22 \cdot 12$   
 $A = \underline{264 \text{ m}^2}$

Assignment:

**8.1 Areas of Special Quadrilaterals Homework Day 1**