



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.

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 39 ft Estimated Width of Classroom 26 ft
Estimated Perimeter of Classroom floor 130 ft Estimated Area of Classroom floor 1014 ft²

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

No. They are found in different ways.



Areas of Triangles and Special Quadrilaterals

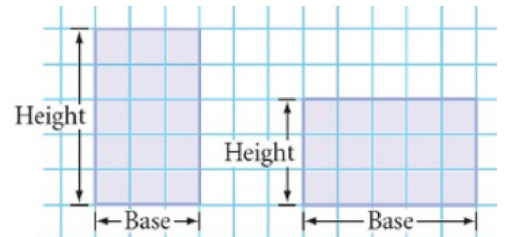
Vocabulary

- **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.

Area of a Rectangle

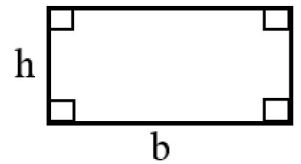
Any side of a rectangle can be called a base. A rectangle's height is the length of the side that is perpendicular to the Base.

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:



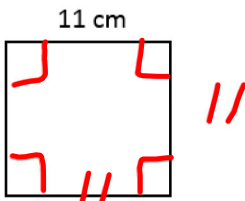
$$\text{Area}_{\text{rectangle}} = \underline{b \cdot h}$$

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)




11 cm

11 cm

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

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

b)



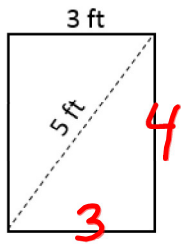
6.5 m

1.5 m

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

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

c)



3 ft

4 ft

5 ft

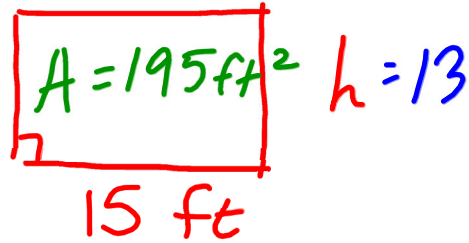
$A = \underline{12 \text{ ft}^2}$

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

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

Perimeter = 56 ft

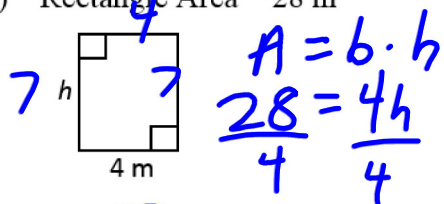
$$13 = h$$



$$\begin{aligned} A &= b \cdot h \\ \frac{195}{15} &= \frac{15h}{15} \\ 13 &= h \end{aligned}$$

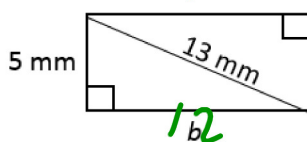
3. Find the missing dimension and perimeter using the given information. 8.1a

a) Rectangle Area = 28 m^2



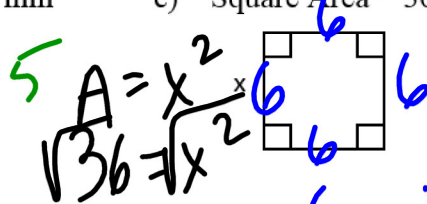
$h = \underline{7 \text{ m}}$
 $P = \underline{22 \text{ m}}$

b) Rectangle Area = 60 mm^2



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

c) Square Area = 36 mi^2



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

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 204



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.

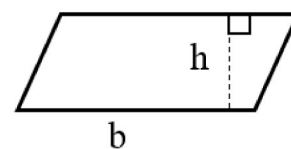
What kind of shape is this? Parallelogram

Write the Area of your new quadrilateral here 204

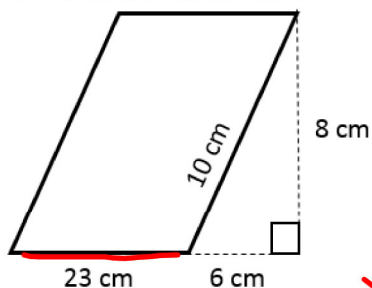
Observe the height and base of the parallelogram. How can you determine the Area without counting squares?

$$\text{Area}_{\text{parallelogram}} = \underline{b \cdot h}$$

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



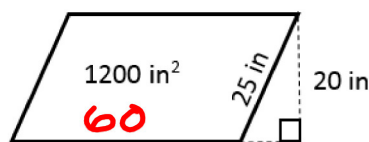
4. Find the Area 8.1b



$$A = 23(8)$$

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

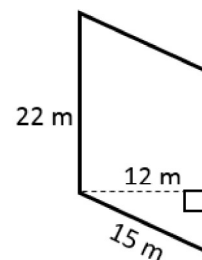
5. Find the base 8.1b



$$1200 = \frac{b(20)}{20}$$

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

6. Find the Area 8.1b



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

Assignment:

8.1 Areas of Special Quadrilaterals Homework Day 1

