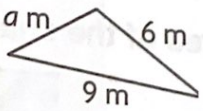
Algebra • Find Unknown Side Lengths

An unknown side length is a side that does not have its length labeled with a number. Instead the side is labeled with a symbol or letter, such as *a*.

The perimeter of the shape is 20 meters. Find the value of *a*.



Think: There is only one unknown side length.

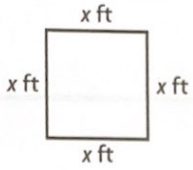
Step 1 Add the *known* side lengths.
$6 + 9 = 15$

Step 2 Subtract the sum of the known side lengths from the perimeter.
$20 - 15 = 5$

Step 3 Add to check your work.
$6 + 9 + 5 = 20$ ✓

So, the unknown side length, *a*, is 5 meters.

The perimeter of the square is 12 feet. What is the length of each side of the square?



Think: A square has four sides of equal length.

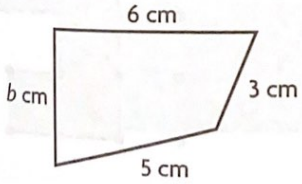
Step 1 Divide the perimeter by the number of sides.
$12 \div 4 = 3$

Step 2 Multiply to check your work.
$4 \times 3 = 12$ ✓

So, the length of each side, *x*, is 3 feet.

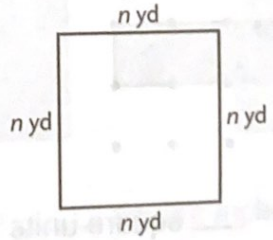
Find the **unknown side lengths.**

1. Perimeter = 18 centimeters



_____ centimeters

2. Perimeter = 20 yards



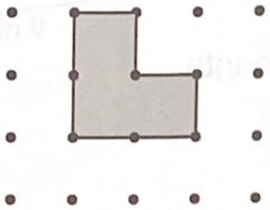
_____ yards

Name _____

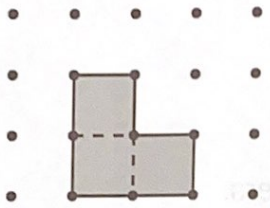
Understand Area

A unit square is a square with a side length of 1 unit. Area is the measure of the number of unit squares needed to cover a surface. A square unit is used to measure area.

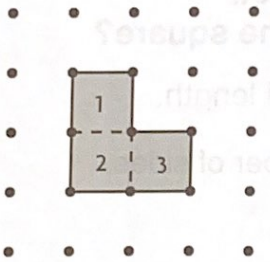
What is the area of the shape?



Step 1 Draw lines to show each unit square in the shape.



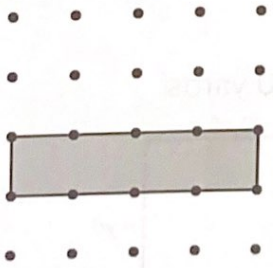
Step 2 Count the number of unit squares to find the area.



The area of the shape is 3 square units.

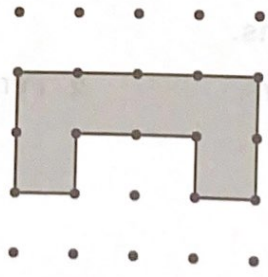
Count to find the area of the shape.

1.



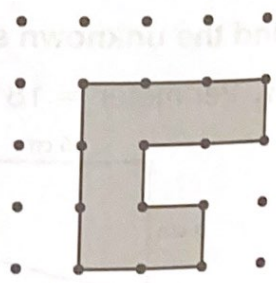
Area = ___ square units

2.



Area = ___ square units

3.

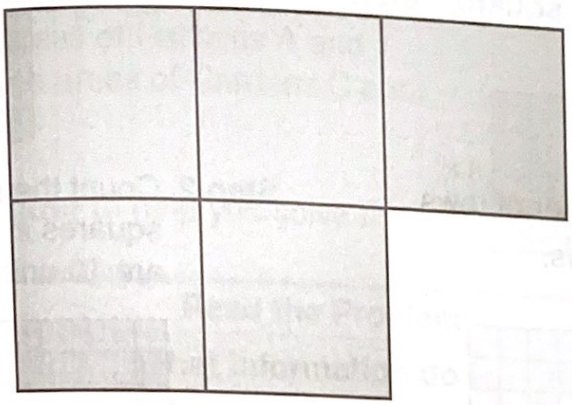


Area = ___ square units

Name _____

Measure Area

Find the area of the shape. Each unit square is 1 square inch.



Think: How many unit squares are needed to cover this flat surface?

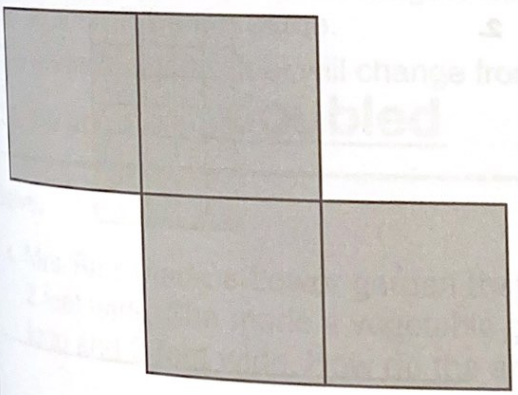
Step 1 Use 1-inch square tiles. Cover the surface of the shape with the tiles. Make sure there are no gaps (space between the tiles). Do not overlap the tiles.

Step 2 Count the tiles you used.
5 tiles are needed to cover the shape.

So, the area of the shape is 5 square inches.

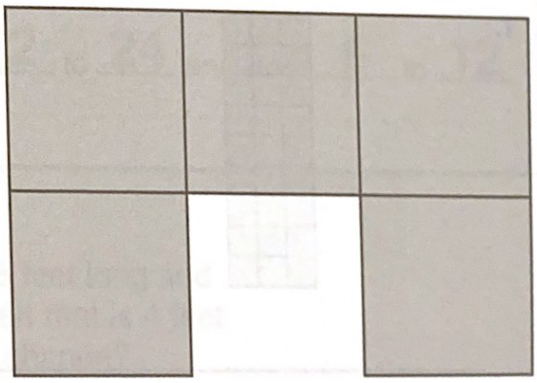
Count to find the area of the shape. Each square is 1 square inch.

1.



Area = _____ square inches

2.

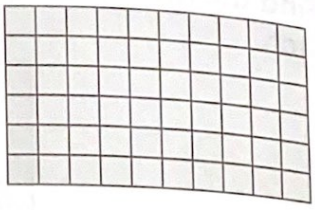


Area = _____ square inches

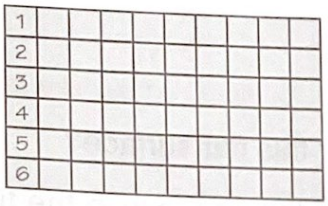
its

Use Area Models

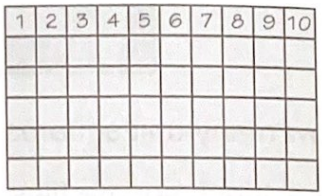
Use multiplication to find the area of the shape.
Each unit square is 1 square meter.



Step 1 Count the number of rows.
There are **6** rows.



Step 2 Count the number of unit squares in each row. There are **10** unit squares.



Step 3 Multiply the number of rows by the number in each row to find the area.

number of rows × number in each row = area

6 × 10 = **60**

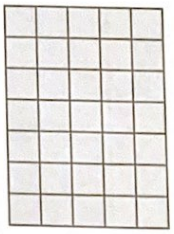
So, the area of the shape is **60** square meters.

Find the area of the shape.
Each unit square is 1 square meter.

1.

_____

2.

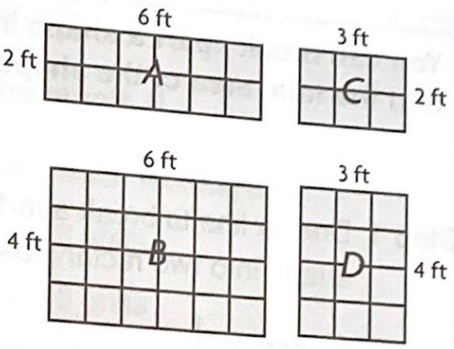


_____

Name _____

Problem Solving • Area of Rectangles

Mrs. Wilson wants to plant a garden, so she drew plans for some sample gardens. She wants to know how the areas of the gardens are related. How will the areas of Gardens A and B change? How will the areas of Gardens C and D change?



Use the graphic organizer to help you solve the problem.

Read the Problem

What do I need to find?	What information do I need to use?	How will I use the information?
I need to know how the areas will change from *A* to *B* and from *C* to *D*.	I need to use the **length** and **width** of each garden to find its area.	I will record the areas in a table. Then I will look for a pattern to see how the **areas** will change.

Solve the Problem

	Length	Width	Area		Length	Width	Area
Garden A	2 ft	6 ft	12 sq ft	Garden C	2 ft	3 ft	6 sq ft
Garden B	4 ft	6 ft	24 sq ft	Garden D	4 ft	3 ft	12 sq ft

From the table, I see that the lengths will be doubled and the widths will be the same.

The areas in square feet will change from **12** to **24** and from **6** to **12**.

So, the area will be **doubled**.

Solve.

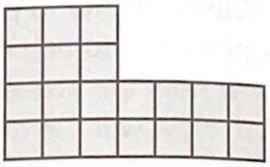
1. Mrs. Rios made a flower garden that is 8 feet long and 2 feet wide. She made a vegetable garden that is 4 feet long and 2 feet wide. How do the areas change?

_____

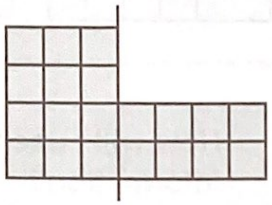
_____

Area of Combined Rectangles

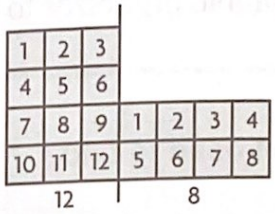
You can break apart a shape into rectangles to find the total area of the shape.



Step 1 Draw a line to break apart the shape into two rectangles.



Step 2 Count the number of unit squares in each rectangle.



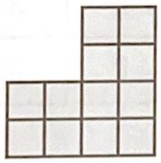
Step 3 Add the number of unit squares in each rectangle to find the total area.

$12 + 8 = 20$ unit squares

So, the area of the shape is 20 square units.

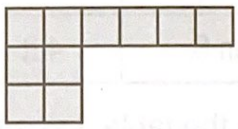
Draw a line to break apart the shape into rectangles. Find the area of the shape.

1.



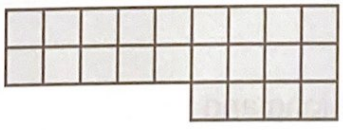
_____

2.



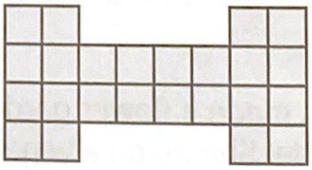
_____

3.



_____

4.



_____

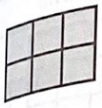
Name _____

Same Perimeter, Different Areas

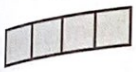
You can use perimeter and area to compare rectangles.

Compare the perimeters of Rectangle *A* and Rectangle *B*.

A



B



Find the number of units around each rectangle.

Rectangle *A*: 3 + 2 + 3 + 2 = 10 units

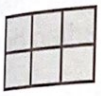
Rectangle *B*: 4 + 1 + 4 + 1 = 10 units

Compare: 10 units = 10 units

So, Rectangle *A* has the same perimeter as Rectangle *B*.

Compare the areas of Rectangle *A* and Rectangle *B*.

A



B

Find the number of unit squares needed to cover each rectangle.

Rectangle *A*: 2 rows of 3 = 2 × 3, or 6 square units

Rectangle *B*: 1 row of 4 = 1 × 4, or 4 square units

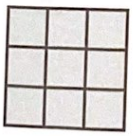
Compare: 6 square units > 4 square units

So, Rectangle *A* has a greater area than Rectangle *B*.

Find the perimeter and the area. Tell which rectangle has a greater area.

1. A

B



A: Perimeter = _____;

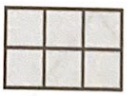
Area = _____

B: Perimeter = _____;

Area = _____

Rectangle ____ has a greater area.

2. A



B

A: Perimeter = _____;

Area = _____

B: Perimeter = _____;

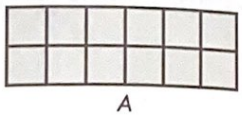
Area = _____

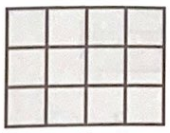
Rectangle ____ has a greater area.

Name _____

Same Area, Different Perimeters

Find the perimeter and area of Rectangles *A* and *B*. Tell which rectangle has a greater perimeter.





Step 1 Find the area of each rectangle. You can multiply the number of unit squares in each row by the number of rows.

Rectangle *A*: $2 \times 6 = 12$ square units

Rectangle *B*: $3 \times 4 = 12$ square units

Step 2 Find the perimeter of each rectangle. You can add the sides.

Rectangle *A*: $6 + 2 + 6 + 2 = 16$ units

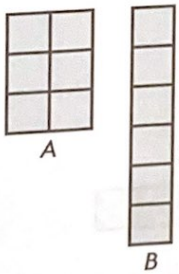
Rectangle *B*: $4 + 3 + 4 + 3 = 14$ units

Step 3 Compare the perimeters. 16 units > 14 units.

So, Rectangle ***A*** has a greater perimeter.

Find the perimeter and the area. Tell which rectangle has a greater perimeter.

1.



A: Area = _____;

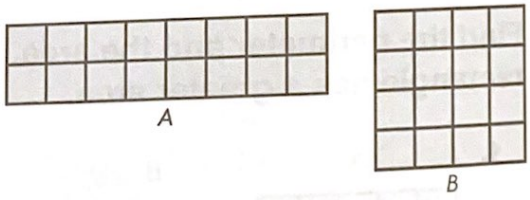
Perimeter = _____

B: Area = _____;

Perimeter = _____

Rectangle ____ has a greater perimeter.

2.



A: Area = _____,

Perimeter = _____

B: Area = _____,

Perimeter = _____

Rectangle ____ has a greater perimeter.