EUREKA MATH PUSD

A Story of Units

Pleasanton UNIFIED SCHOOL DISTRICT Mathematics Curriculum

Grade 3 • MODULE 4

Multiplication and Area

HOMEWORK

Video tutorials: http://embarc.online

Info for parents: http://bit.ly/pusdmath

Version 3

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GRADE 3 • MODULE 4

Multiplication and Area

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NOTE: Student sheets should be printed at 100% scale to preserve the intended size of figures for accurate measurements. Adjust copier or printer settings to *actual size* and set page scaling to *none*.

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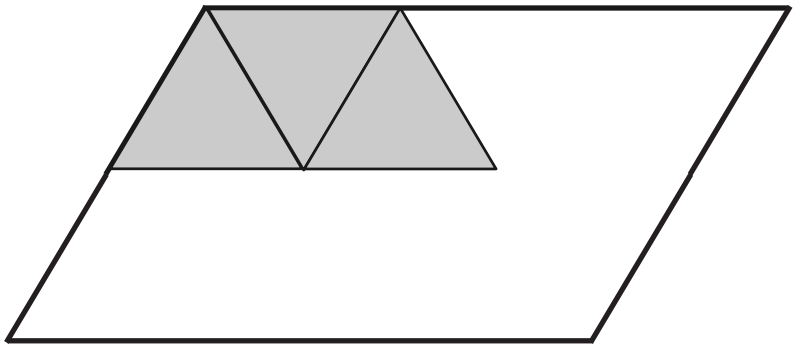
Name _____ Date _____

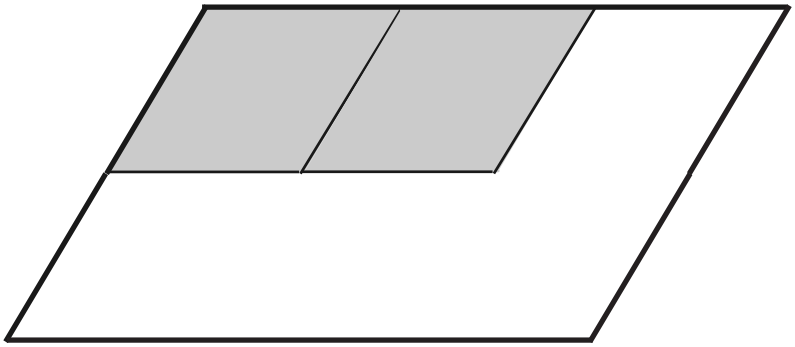
1. Magnus covers the same shape with triangles, rhombuses, and trapezoids.

   a. How many triangles will it take to cover the shape?



_____ triangles

   b. How many rhombuses will it take to cover the shape?



_____ rhombuses

   c. Magnus notices that 3 triangles from Part (a) cover 1 trapezoid. How many trapezoids will you need to cover the shape below? Explain your answer.

_____ trapezoids

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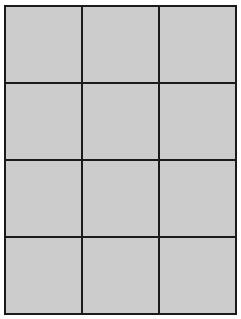
2. Angela uses squares to find the area of a rectangle. Her work is shown below.

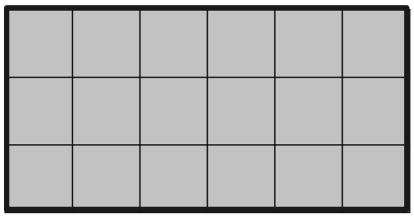
   a. How many squares did she use to cover the rectangle?



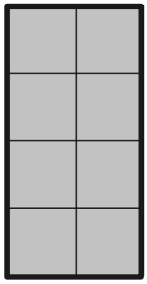
_____ squares

   b. What is the area of the rectangle in square units? Explain how you found your answer.

3. Each is 1 square unit. Which rectangle has the largest area? How do you know?



Rectangle A



Rectangle B

Rectangle C

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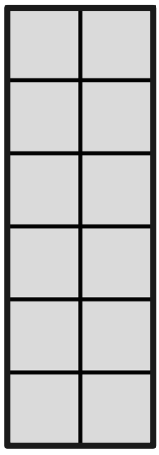
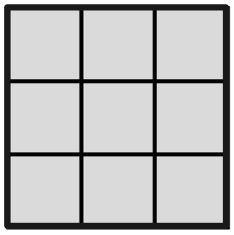
1. Each ☐ is a square unit. Count to find the area of each rectangle. Then, circle all the rectangles with an area of 12 square units.

a.



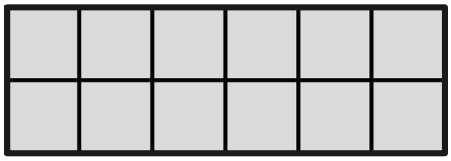
Area = _____ square units

b.



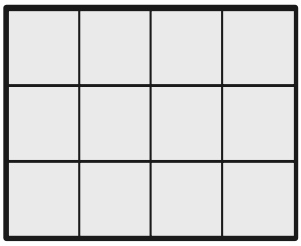
Area = _____ square units

c.



Area = _____ square units

d.

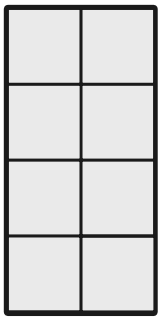


Area = _____ square units

e.

Area = _____ square units

f.



Area = _____ square units

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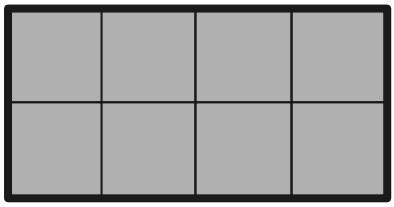
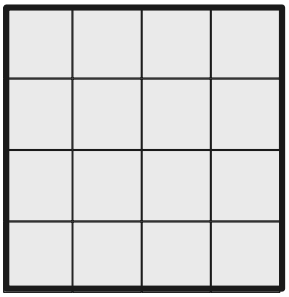
2. Colin uses square units to create these rectangles. Do they have the same area? Explain.



3. Each is a square unit. Count to find the area of the rectangle below. Then, draw a different rectangle that has the same area.



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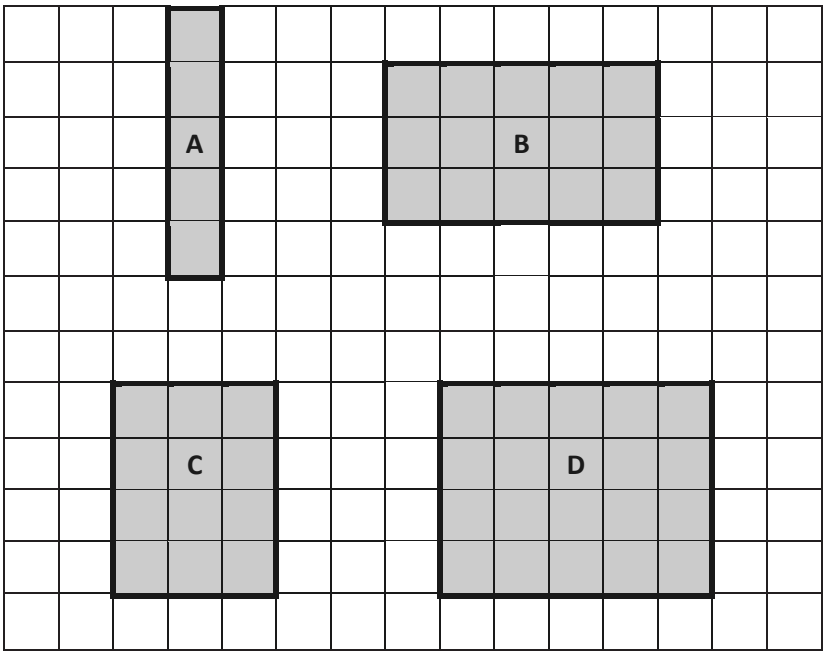
1. Each ☐ is 1 square unit. What is the area of each of the following rectangles?



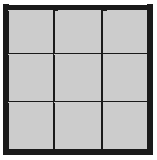
A: _____ square units

B: _____

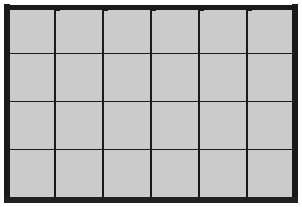
C: _____

D: _____

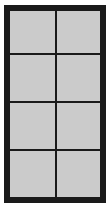
2. Each ▢ is 1 square unit. What is the area of each of the following rectangles?

a. 

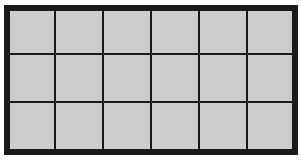
_____

b. 

_____

c. 

_____

d. 

_____

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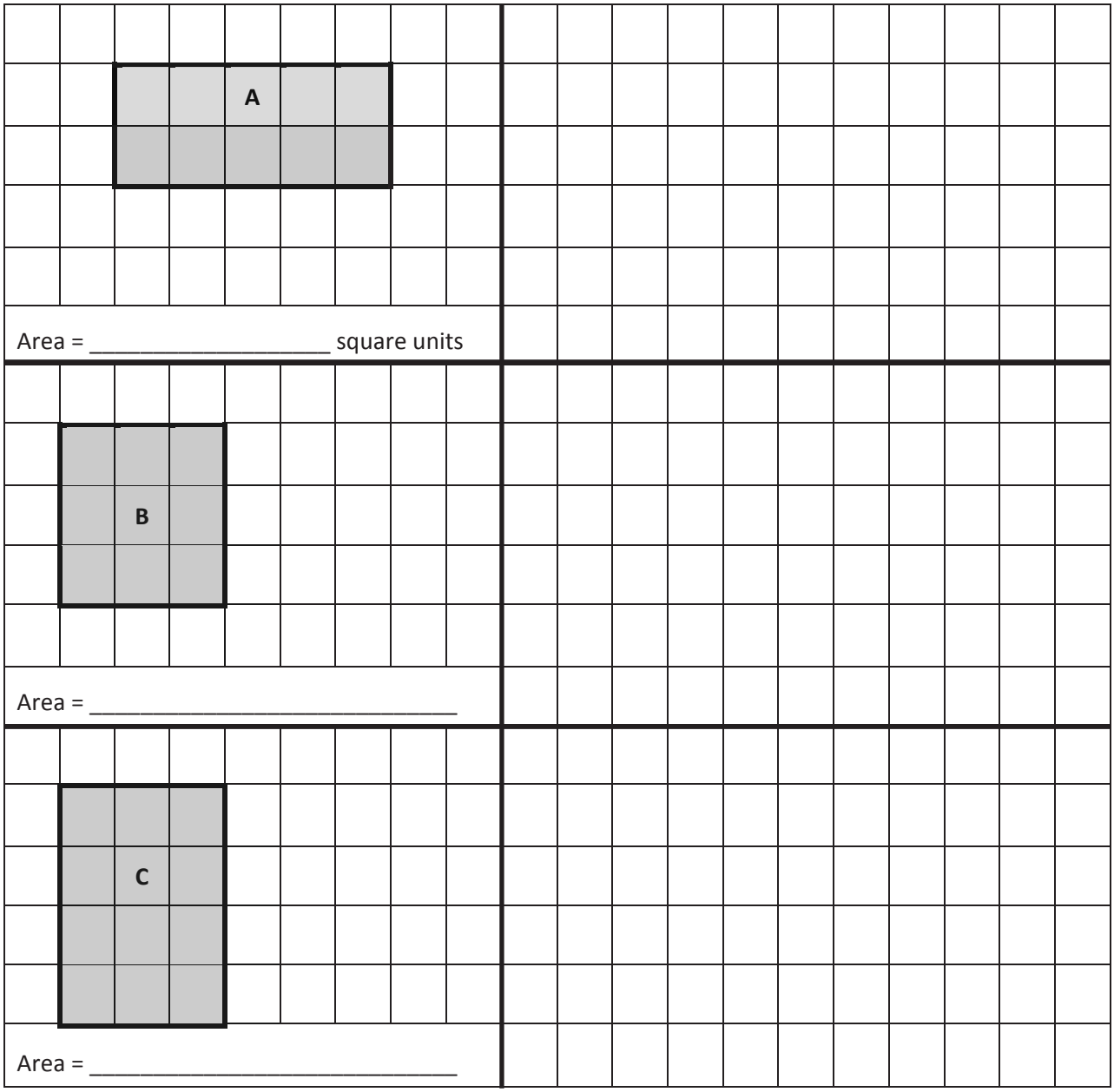
3. Each ☐ is 1 square unit. Write the area of each rectangle. Then, draw a different rectangle with the same area in the space provided.



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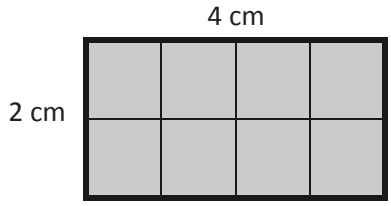
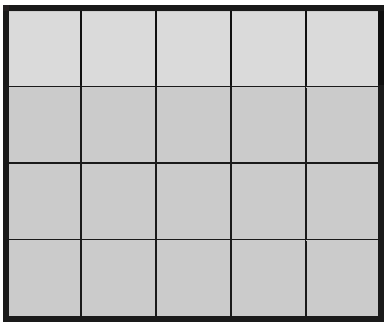
1. Ella placed square centimeter tiles on the rectangle below, and then labeled the side lengths. What is the area of her rectangle?



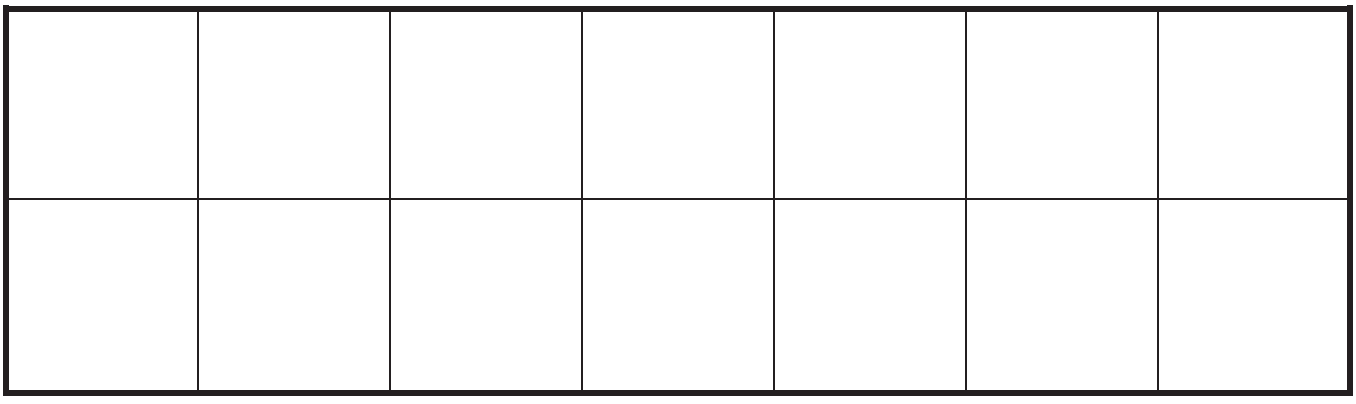
Total area: _____

2. Kyle uses square centimeter tiles to find the side lengths of the rectangle below. Label each side length. Then, count the tiles to find the total area.



Total area: _____

3. Maura uses square inch tiles to find the side lengths of the rectangle below. Label each side length. Then, find the total area.



Total area: _____

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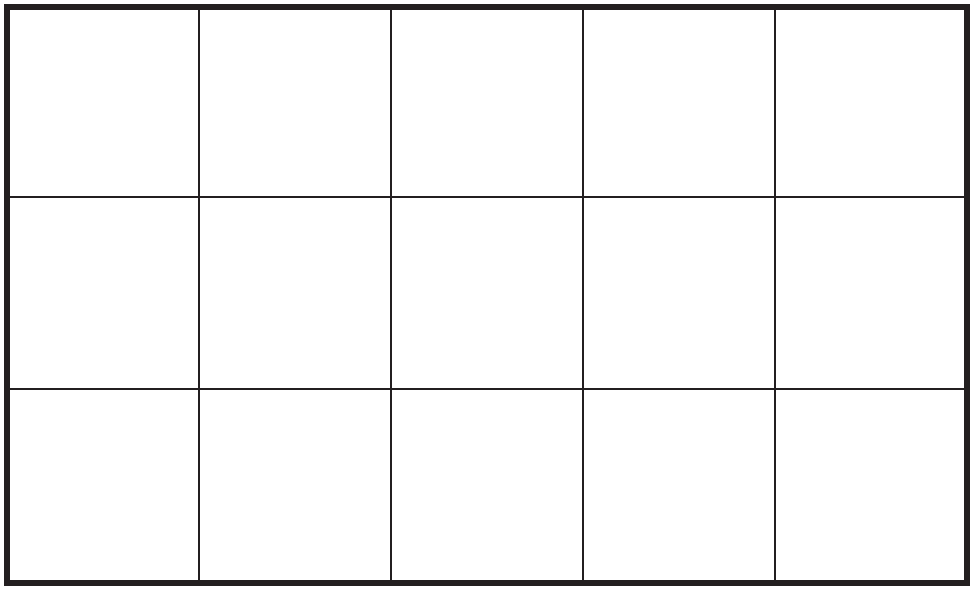
4. Each square unit below is 1 square inch. Claire says that the side length of the rectangle below is 3 inches. Tyler says the side length is 5 inches. Who is correct? Explain how you know.



5. Label the unknown side lengths for the rectangle below, and then find the area. Explain how you used the lengths provided to find the unknown lengths and area.

4 inches

2 inches

_____

_____

Total area: _____

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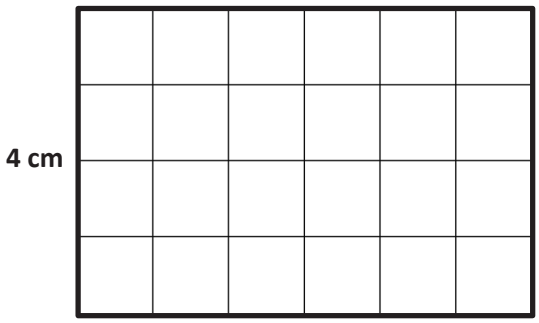
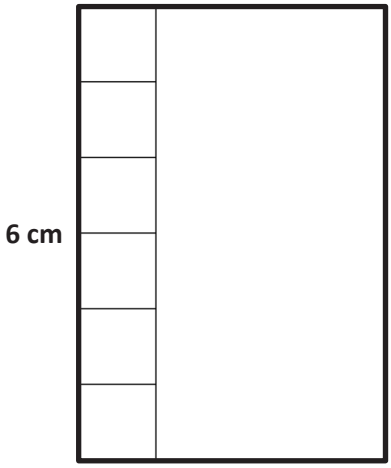
1. Use the centimeter side of a ruler to draw in the tiles, and then skip-count to find the unknown area. Write a multiplication sentence for each tiled rectangle.

a. Area: **24** square centimeters.



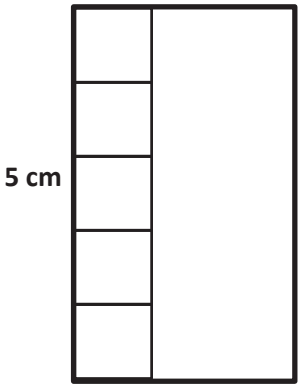
4 × _____ = 24

b. Area: **24** square centimeters.



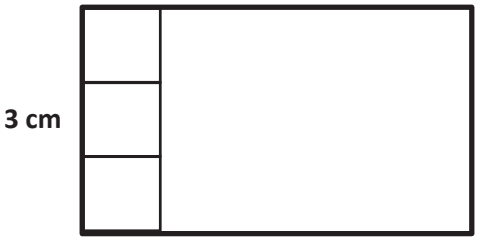
_____ × _____ = _____

c. Area: **15** square centimeters.



_____ × _____ = _____

d. Area: **15** square centimeters.



_____ × _____ = _____

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2. Ally makes a rectangle with 45 square inch tiles. She arranges the tiles in 5 equal rows. How many square inch tiles are in each row? Use words, pictures, and numbers to support your answer.

3. Leon makes a rectangle with 36 square centimeter tiles. There are 4 equal rows of tiles.

   a. How many tiles are in each row? Use words, pictures, and numbers to support your answer.

   b. Can Leon arrange all of his 36 square centimeter tiles into 6 equal rows? Use words, pictures, and numbers to support your answer.

   c. Do the rectangles in Parts (a) and (b) have the same total area? Explain how you know.

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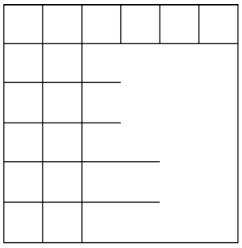
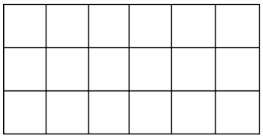
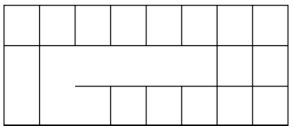
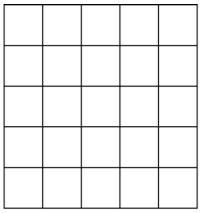
1. Each ☐ represents 1 square centimeter. Draw to find the number of rows and columns in each array. Match it to its completed array. Then, fill in the blanks to make a true equation to find each array's area.

a. 



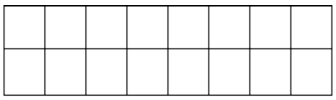
_____ cm × _____ cm = _____ sq cm

b. 

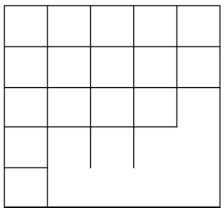


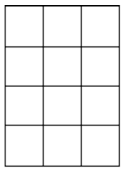
_____ cm × _____ cm = _____ sq cm

c.

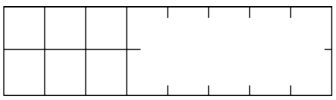


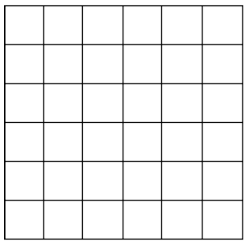
_____ cm × _____ cm = _____ sq cm

d. 

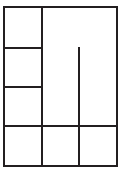


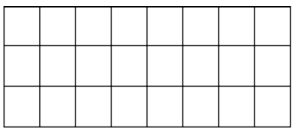
_____ cm × _____ cm = _____ sq cm

e. 



_____ cm × _____ cm = _____ sq cm

f. 



_____ cm × _____ cm = _____ sq cm

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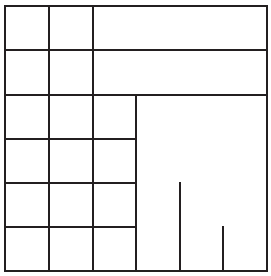
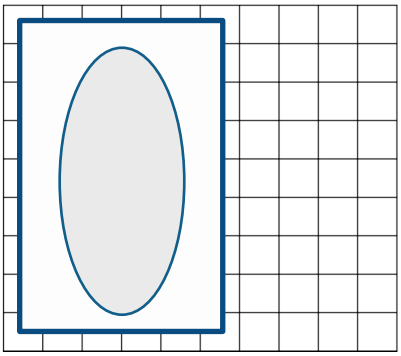
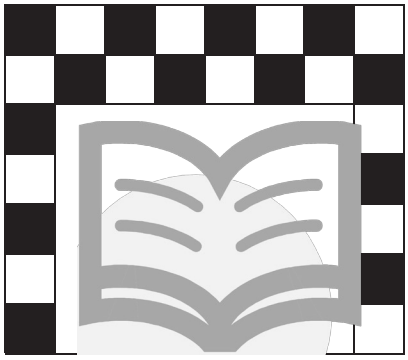
2. Minh skip-counts by sixes to find the total square units in the rectangle below. She says there are 36 square units. Is she correct? Explain your answer.



3. The tub in Paige's bathroom covers the tile floor as shown below. How many square tiles are on the floor, including the tiles under the tub?



4. Frank sees a book on top of his chessboard. How many squares are covered by the book? Explain your answer.



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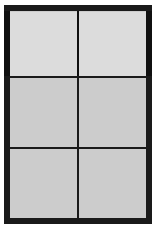
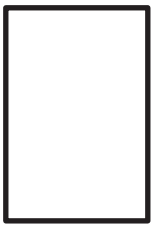
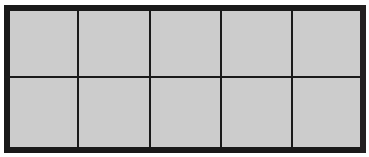
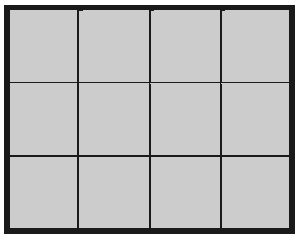
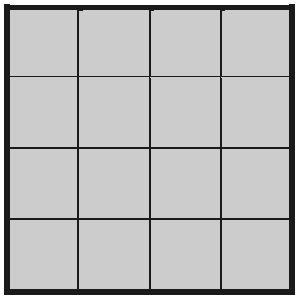
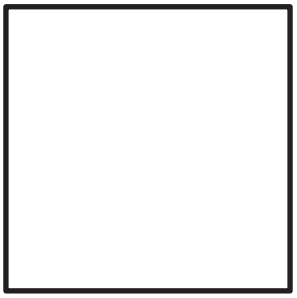
1. Find the area of each rectangular array. Label the side lengths of the matching area model, and write a multiplication equation for each area model.

Rectangular Arrays	Area Models
a.  _____ square units	3 units  2 units 3 units × _____ units = _____ square units
b.  _____ square units	_____ units × _____ units = _____ square units
c.  _____ square units	_____ units × _____ units = _____ square units
d.  _____ square units	 _____ units × _____ units = _____ square units

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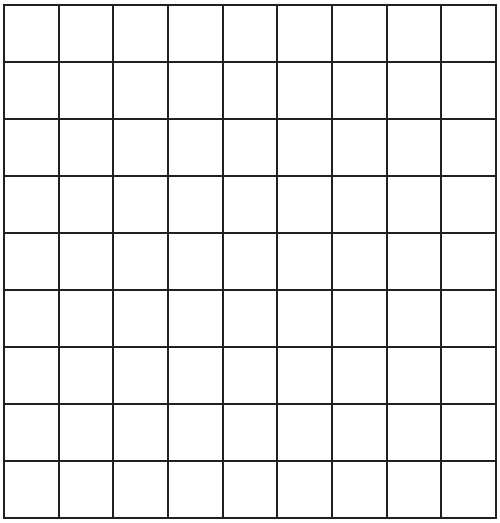
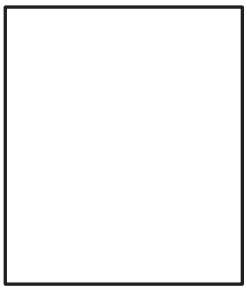
2. Jillian arranges square pattern blocks into a 7 by 4 array. Draw Jillian's array on the the grid below. How many square units are in Jillian's rectangular array?

   a.



   b. Label the side lengths of Jillian's array from Part (a) on the rectangle below. Then, write a multiplication sentence to represent the area of the rectangle.



3. Fiona draws a 24 square centimeter rectangle. Gregory draws a 24 square inch rectangle. Whose rectangle is larger in area? How do you know?

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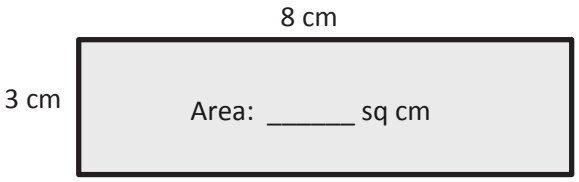
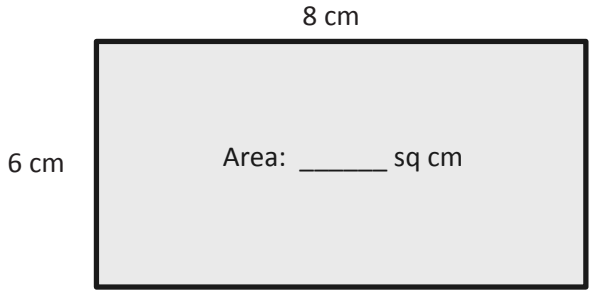
1. Write a multiplication equation to find the area of each rectangle.

a.



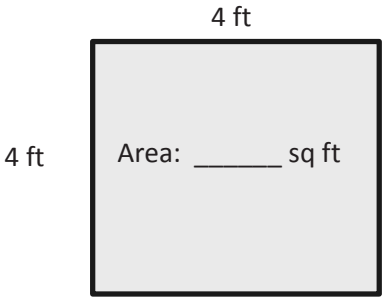
_____ × _____ = _____

b.



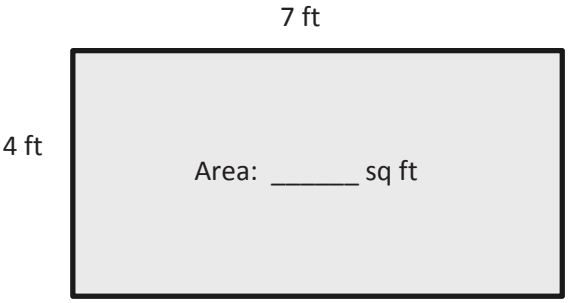
_____ × _____ = _____

c.



_____ × _____ = _____

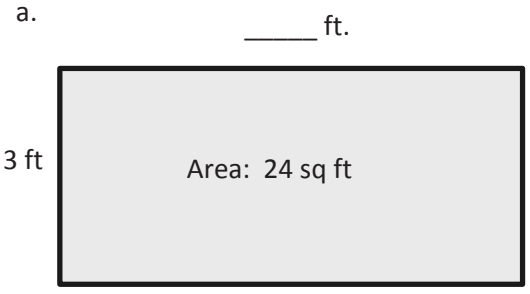
d.



_____ × _____ = _____

2. Write a multiplication equation and a division equation to find the unknown side length for each rectangle.

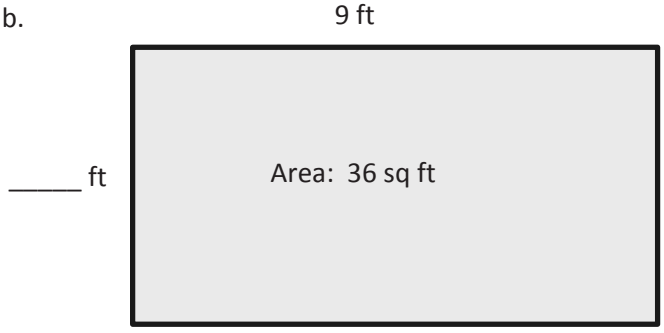
a.



_____ × _____ = _____

_____ ÷ _____ = _____

b.



_____ × _____ = _____

_____ ÷ _____ = _____

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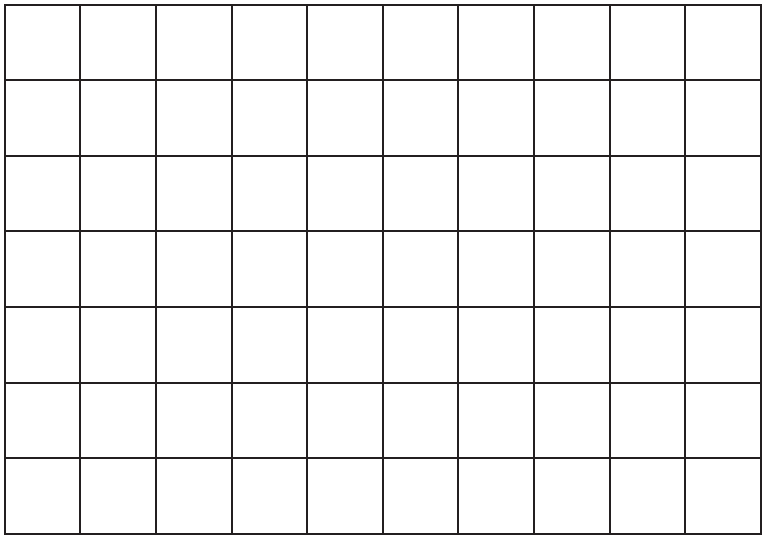
3. On the grid below, draw a rectangle that has an area of 32 square centimeters. Label the side lengths.



4. Patricia draws a rectangle that has side lengths of 4 centimeters and 9 centimeters. What is the area of the rectangle? Explain how you found your answer.

5. Charles draws a rectangle with a side length of 9 inches and an area of 27 square inches. What is the other side length? How do you know?

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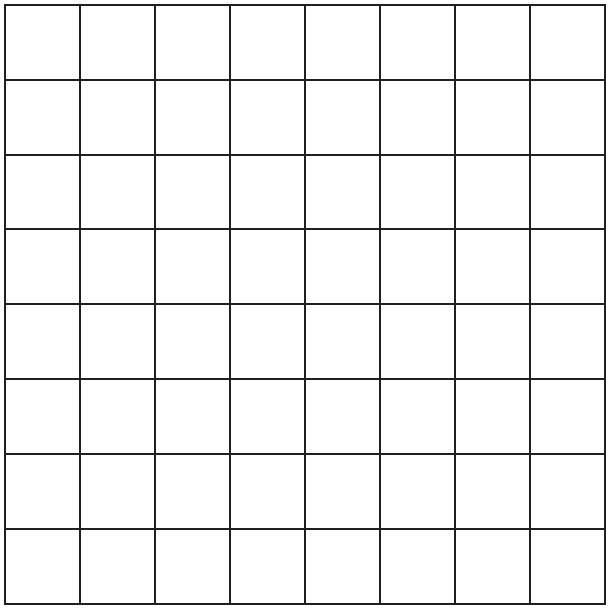
1. Use the grid to answer the questions below.



a. Draw a line to divide the grid into 2 equal rectangles. Shade in 1 of the rectangles that you created.

b. Label the side lengths of each rectangle.

c. Write an equation to show the total area of the 2 rectangles.

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2. Alexa cuts out the 2 equal rectangles from Problem 1(a) and puts the two shorter sides together.

   a. Draw Alexa's new rectangle and label the side lengths below.

   b. Find the total area of the new, longer rectangle.

   c. Is the area of the new, longer rectangle equal to the total area in Problem 1(c)? Explain why or why not.

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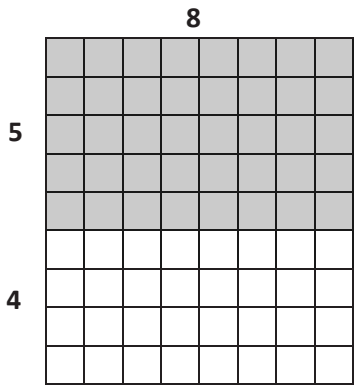
1. Label the side lengths of the shaded and unshaded rectangles. Then, find the total area of the large rectangle by adding the areas of the 2 smaller rectangles.

a.



$9 \times 8 = (5 + 4) \times 8$

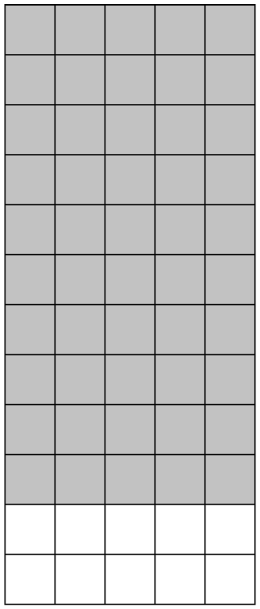
$= (5 \times 8) + (4 \times 8)$

$=$ _____ + _____

$=$ _____

Area: _____ square units

b.



$12 \times 5 = (_____ + 2) \times 5$

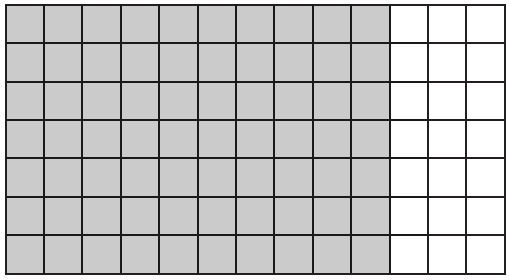
$= (_____ \times 5) + (2 \times 5)$

$=$ _____ + 10

$=$ _____

Area: _____ square units

c.



$7 \times 13 = 7 \times (_____ + 3)$

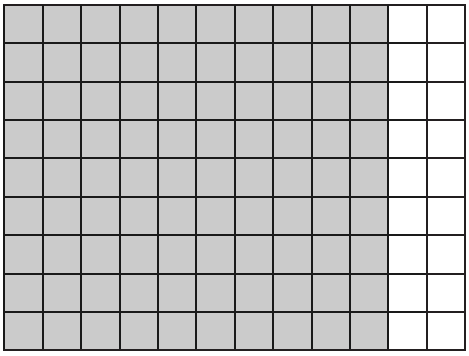
$= (7 \times _____) + (7 \times 3)$

$=$ _____ + _____

$=$ _____

Area: _____ square units

d.



$9 \times 12 = 9 \times (_____ + _____)$

$= (9 \times _____) + (9 \times _____)$

$=$ _____ + _____

$=$ _____

Area: _____ square units

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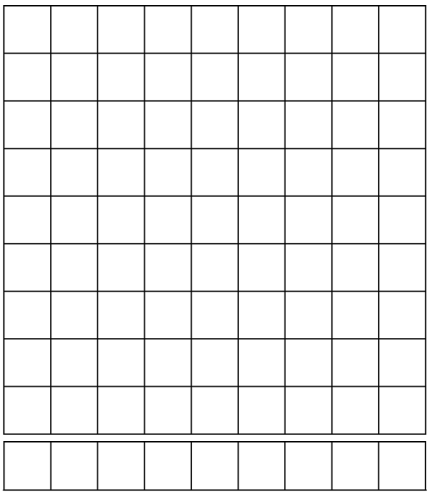
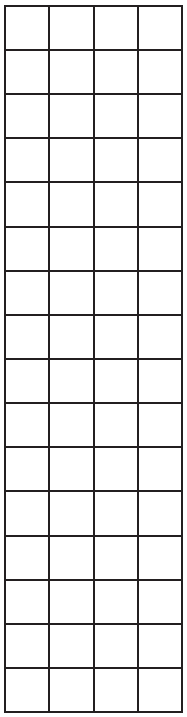
2. Finn imagines 1 more row of nine to find the total area of 9 × 9 rectangle. Explain how this could help him solve 9 × 9.



3. Shade an area to break the 16 × 4 rectangle into 2 smaller rectangles. Then, find the sum of the areas of the 2 smaller rectangles to find the total area. Explain your thinking.



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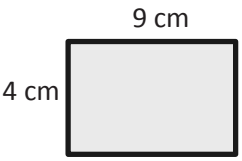
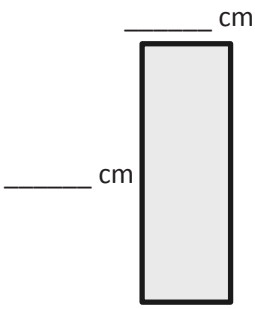
1. The rectangles below have the same area. Move the parentheses to find the unknown side lengths. Then, solve.



a. Area: 4 × _____ = _____

Area: _____ sq cm



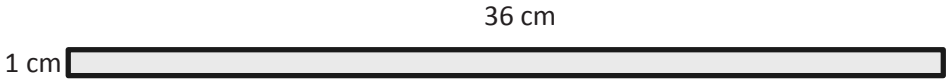
d. Area: **4 × 9** = 4 × (3 × 3)

= 4 × 3 × 3

= _____ × _____

= _____

Area: _____ sq cm



b. Area: 1 × 36 = _____

Area: _____ sq cm

c. Area: **4 × 9** = (2 × 2) × 9

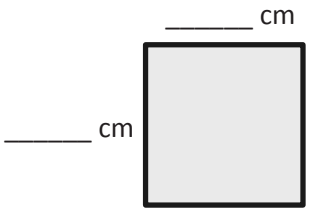
= 2 × 2 × 9

= _____ × _____

= _____

Area: _____ sq cm

e. Area: **12 × 3** = (6 × 2) × 3



= 6 × 2 × 3

= _____ × _____

= _____

Area: _____ sq cm

2. Does Problem 1 show all the possible whole number side lengths for a rectangle with an area of 36 square centimeters? How do you know?

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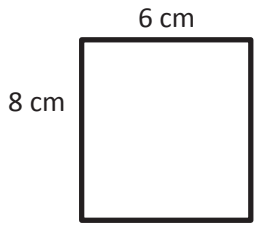
3. a. Find the area of the rectangle below.



b. Hilda says a 4 cm by 12 cm rectangle has the same area as the rectangle in Part (a). Place parentheses in the equation to find the related fact and solve. Is Hilda correct? Why or why not?

4 × 12 = 4 × 2 × 6

= 4 × 2 × 6

= _____ × _____

= _____

Area: _____ sq cm

c. Use the expression 8 × 6 to find different side lengths for a rectangle that has the same area as the rectangle in Part (a). Show your equations using parentheses. Then, estimate to draw the rectangle and label the side lengths.

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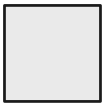
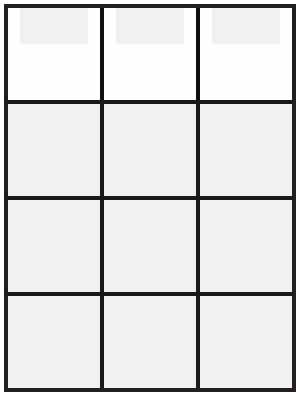
1. A square calendar has sides that are 9 inches long. What is the calendar's area?

2. Each  is 1 square unit. Sienna uses the same square units to draw a 6 × 2 rectangle and says that it has the same area as the rectangle below. Is she correct? Explain why or why not.



3. The surface of an office desk has an area of 15 square feet. Its length is 5 feet. How wide is the office desk?

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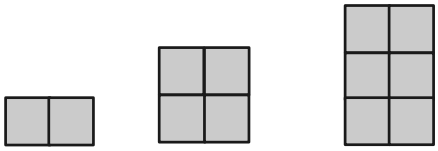
4. A rectangular garden has a total area of 48 square yards. Draw and label two possible rectangular gardens with different side lengths that have the same area.

5. Lila makes the pattern below. Find and explain her pattern. Then, draw the *fifth* figure in her pattern.



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Name _____ Date _____

1. Each of the following figures is made up of 2 rectangles. Find the total area of each figure.

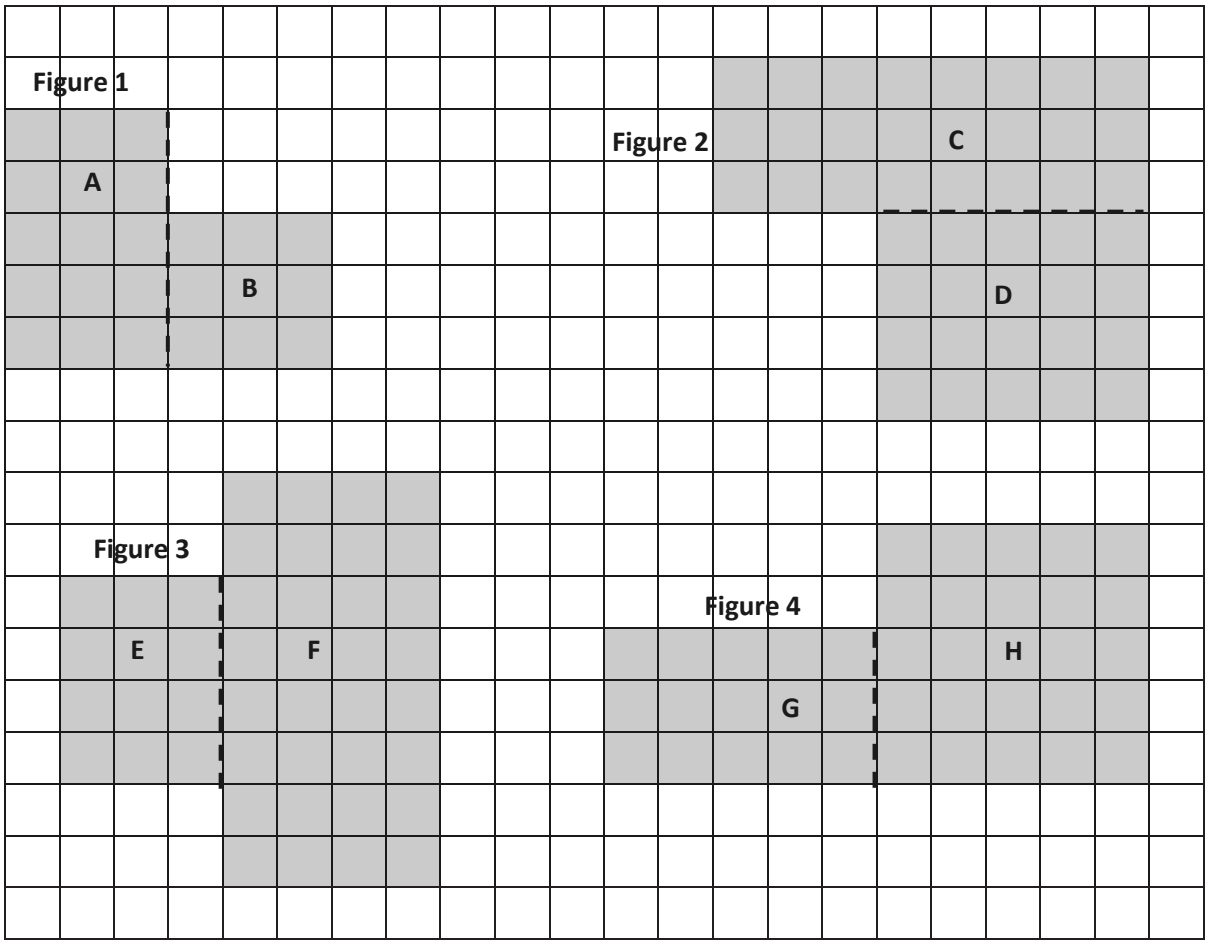

Figure 1: Area of A + Area of B: _____ sq units + _____ sq units = _____ sq units

Figure 2: Area of C + Area of D: _____ sq units + _____ sq units = _____ sq units

Figure 3: Area of E + Area of F: _____ sq units + _____ sq units = _____ sq units

Figure 4: Area of G + Area of H: _____ sq units + _____ sq units = _____ sq units

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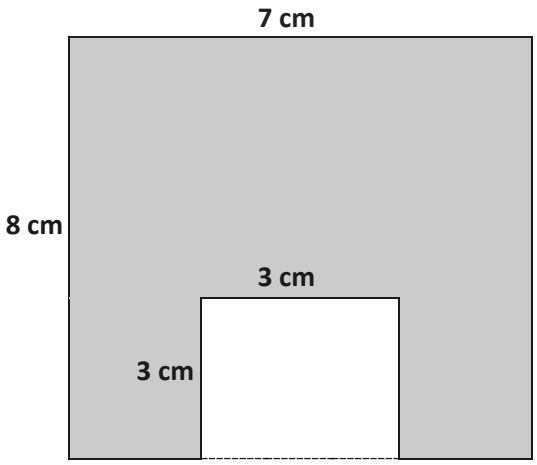
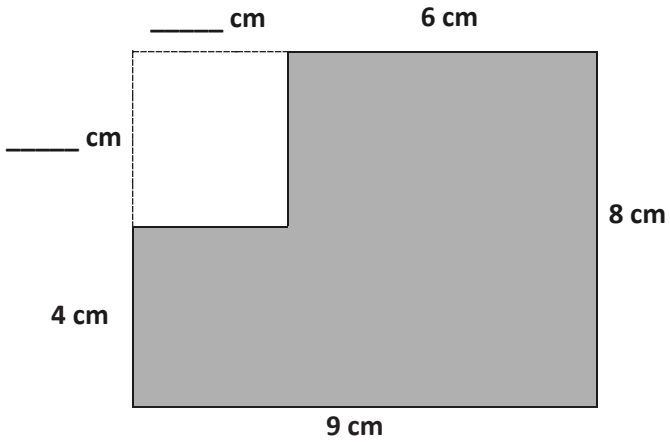
2. The figure shows a small rectangle cut out of a big rectangle. Find the area of the shaded figure.



Area of the shaded figure: _____ – _____ = _____

Area of the shaded figure: _____ square centimeters

3. The figure shows a small rectangle cut out of a big rectangle.



a. Label the unknown measurements.

b. Area of the big rectangle:

_____ cm × _____ cm = _____ sq cm

c. Area of the small rectangle:

_____ cm × _____ cm = _____ sq cm

d. Find the area of the shaded figure.

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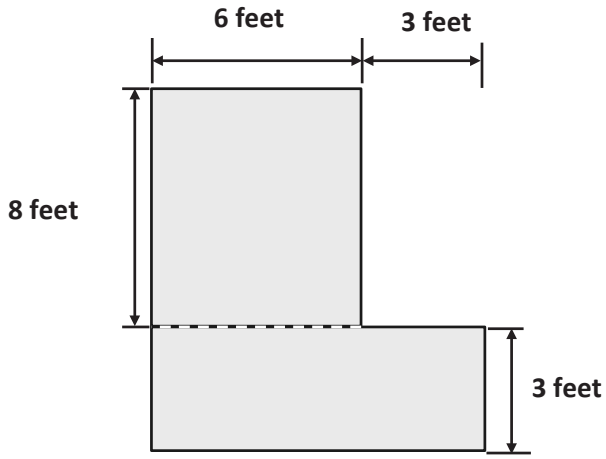
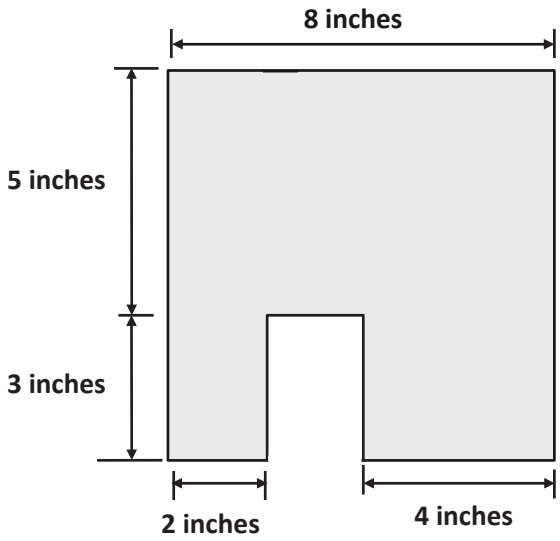
1. Find the area of each of the following figures. All figures are made up of rectangles.

a.



b.



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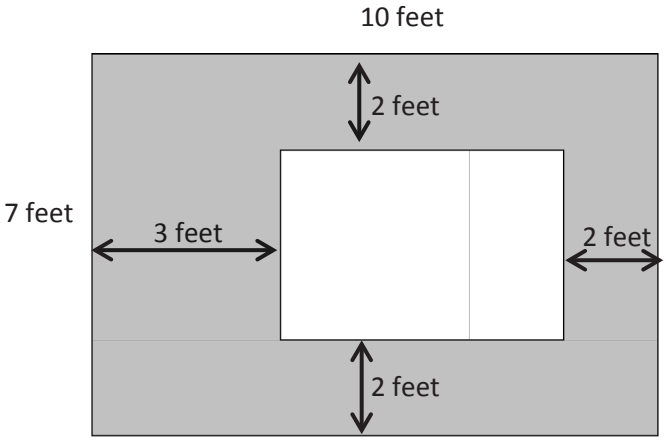
2. The figure below shows a small rectangle cut out of a big rectangle.



a. Label the side lengths of the unshaded region.

b. Find the area of the shaded region.

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Use a ruler to measure the side lengths of each numbered room in centimeters. Then, find the area. Use the measurements below to match, and label the rooms with the correct areas.

Kitchen: 45 square centimeters

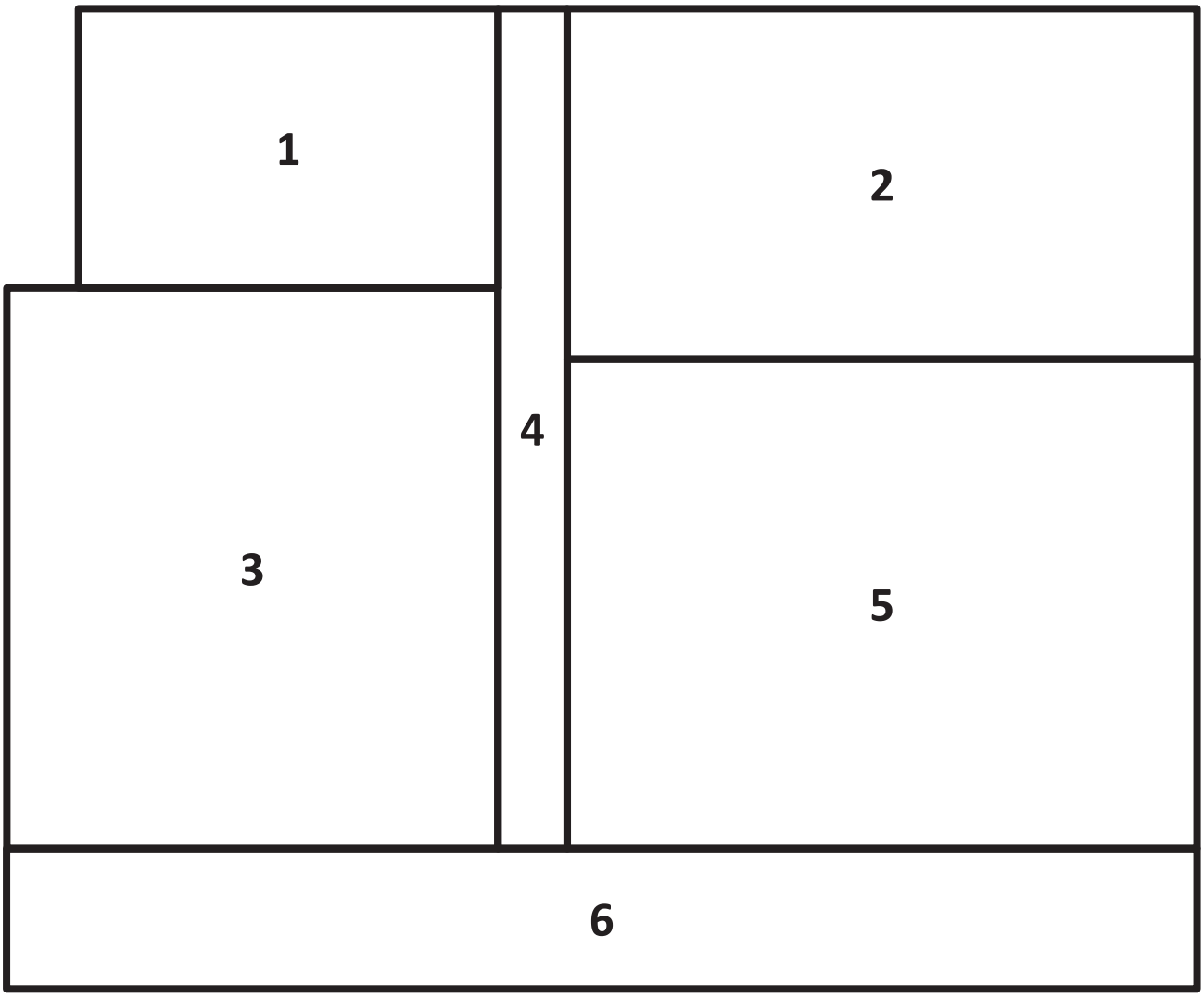
Living Room: 63 square centimeters

Porch: 34 square centimeters

Bedroom: 56 square centimeters

Bathroom: 24 square centimeters

Hallway: 12 square centimeters



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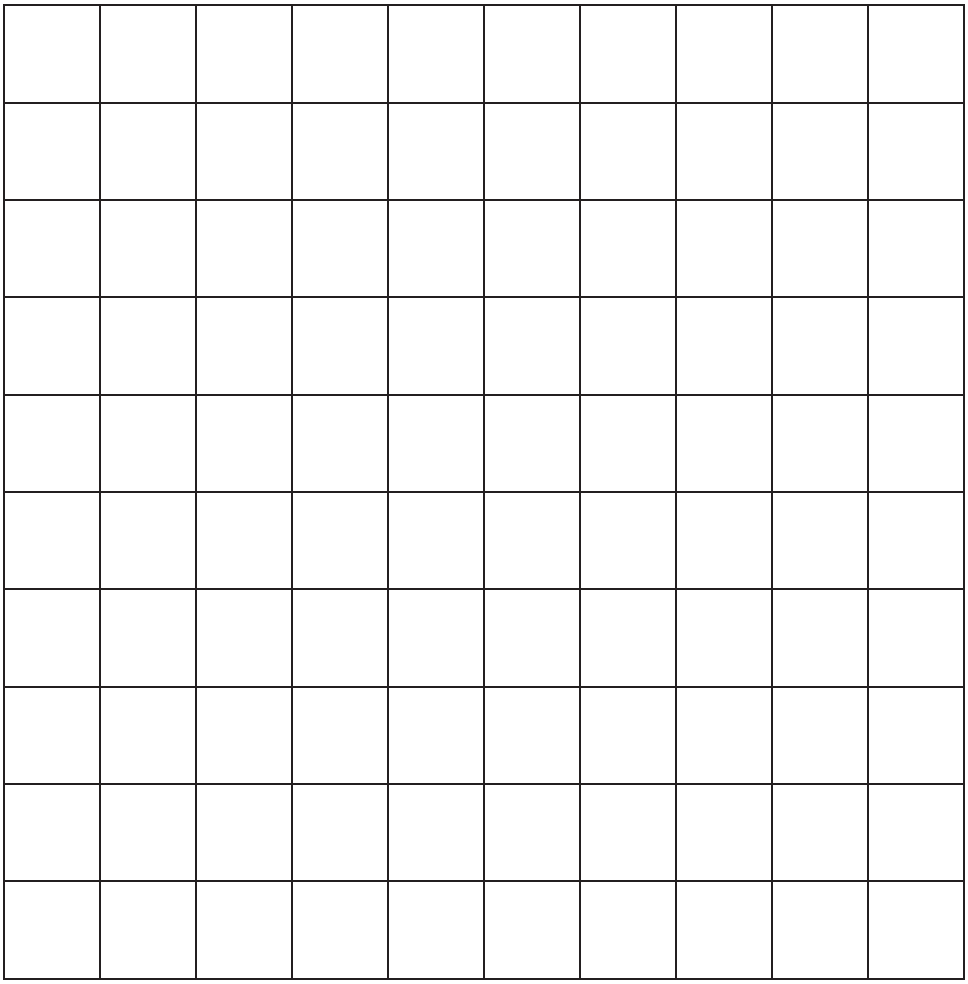
Jeremy plans and designs his own dream playground on grid paper. His new playground will cover a total area of 100 square units. The chart shows how much space he gives for each piece of equipment, or area. Use the information in the chart to draw and label a possible way Jeremy can plan his playground.

Basketball court	10 square units
Jungle gym	9 square units
Slide	6 square units
Soccer area	24 square units



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Video tutorials: http://embarc.online
Info for parents: http://bit.ly/pusdmath