



## **Grade 3, Module 4: Multiplication and Area**

### **Mission: Find the Area**

#### **Topic A: Foundations for Understanding Area**

In Topic A, students begin to conceptualize area as the amount of two-dimensional surface that is contained within a plane figure. Students also gain their first experience with tiling, which allows them to distinguish between length and area.

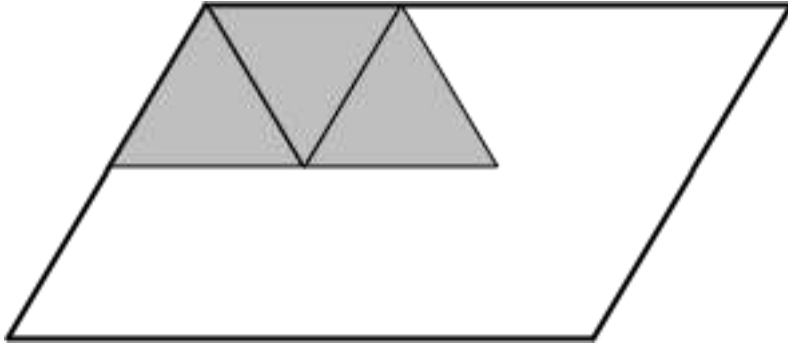
Grade 3 Mission 4 Lesson 1 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

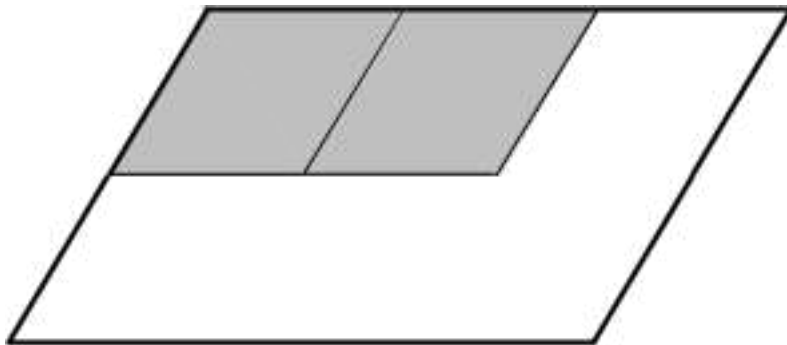
1. Magnus covers the same shape with triangles, rhombuses, and trapezoids

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 it take to cover the shape below? Explain your answer.



\_\_\_\_\_ trapezoids


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

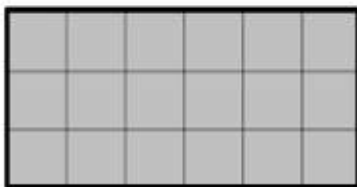
a. How many squares did she use to cover the rectangle?



\_\_\_\_\_ 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 biggest area? How do you know?



Rectangle A



Rectangle B




Rectangle C

Grade 3 Mission 4 Lesson 2 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

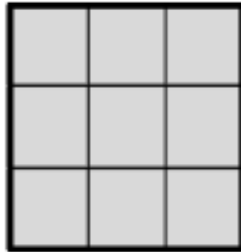
1. Each  is a square unit. Count to find the area of each rectangle. Then circle all the rectangles with an area of 12 square units.

a.



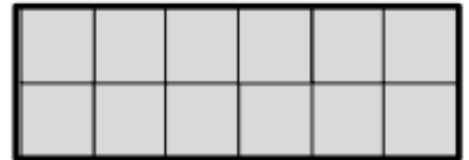
Area = \_\_\_\_\_ square units

b.



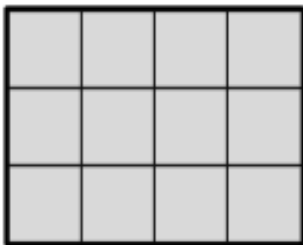
Area = \_\_\_\_\_ square units

c.



Area = \_\_\_\_\_ square units

d.



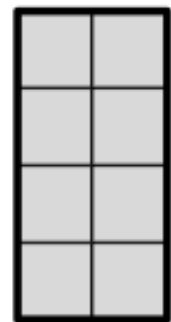
Area = \_\_\_\_\_ square units

e.



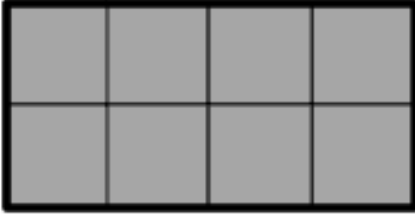
Area = \_\_\_\_\_ square units


f.

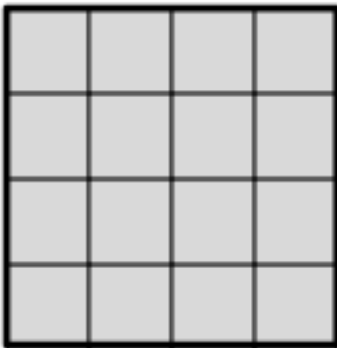


Area = \_\_\_\_\_ square units

2. Colin uses square inch pieces 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.

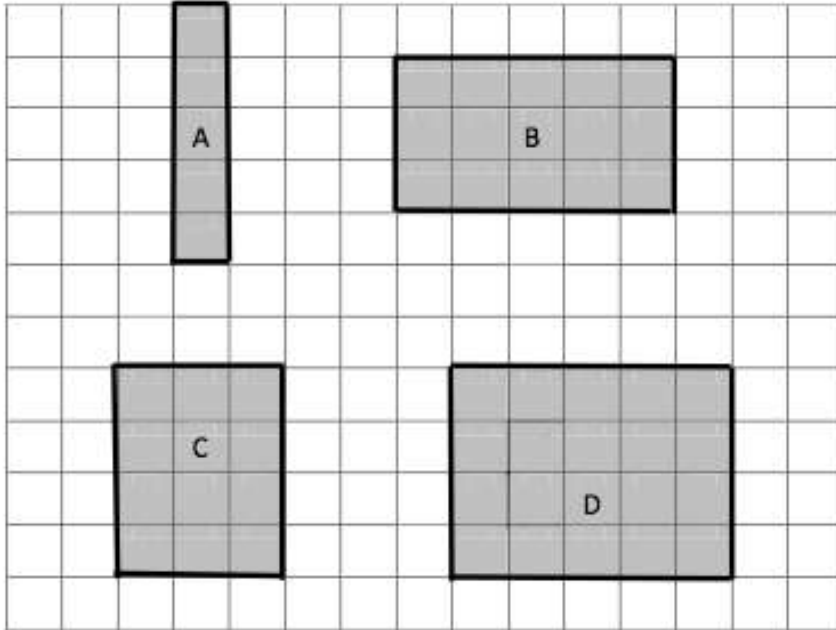


Grade 3 Mission 4 Lesson 3 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

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




A: \_\_\_\_\_ square units

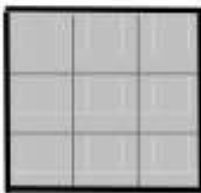
B: \_\_\_\_\_

C: \_\_\_\_\_

D: \_\_\_\_\_

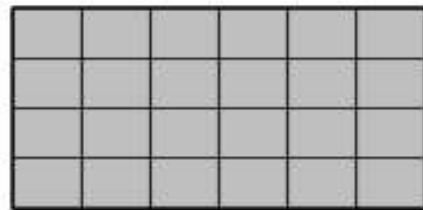
2. Each  is 1 square unit. What is the area of each of the following rectangles?

a.



\_\_\_\_\_

b.



\_\_\_\_\_

c.




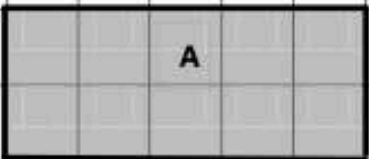
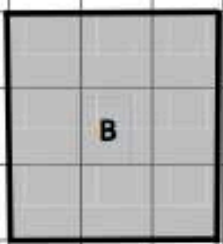
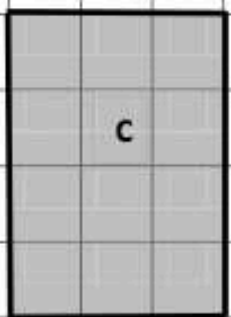
\_\_\_\_\_

d.



\_\_\_\_\_

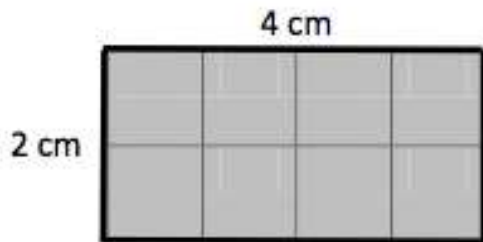
3. Each  is 1 square unit. Write the area of each rectangle. Then draw another rectangle with the same area in the space provided.

|  |  |
|--|--|
| <br>A   |  |
| Area = _____ square units  |  |
| <br>B  |  |
| Area = _____   |  |
| <br>C |  |
| Area = _____   |  |

Grade 3 Mission 4 Lesson 4 Homework

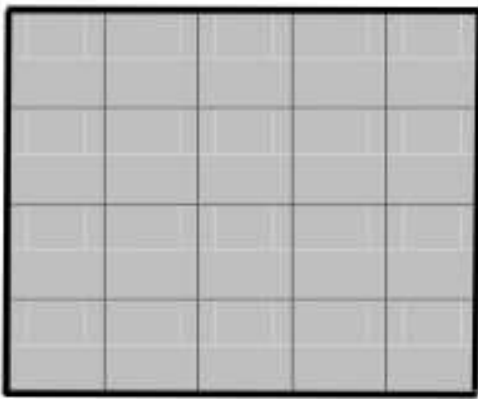
Name \_\_\_\_\_ Date \_\_\_\_\_

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



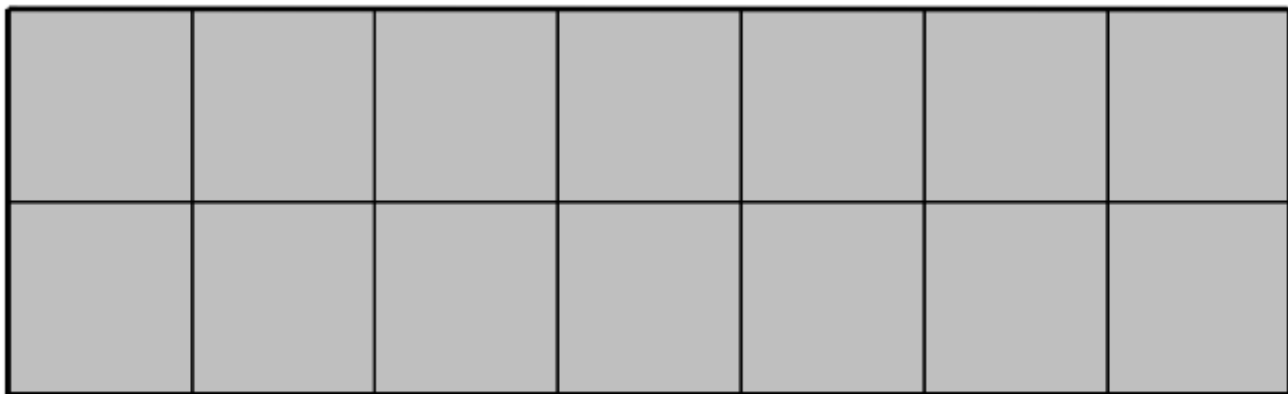
Total area: \_\_\_\_\_

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: \_\_\_\_\_

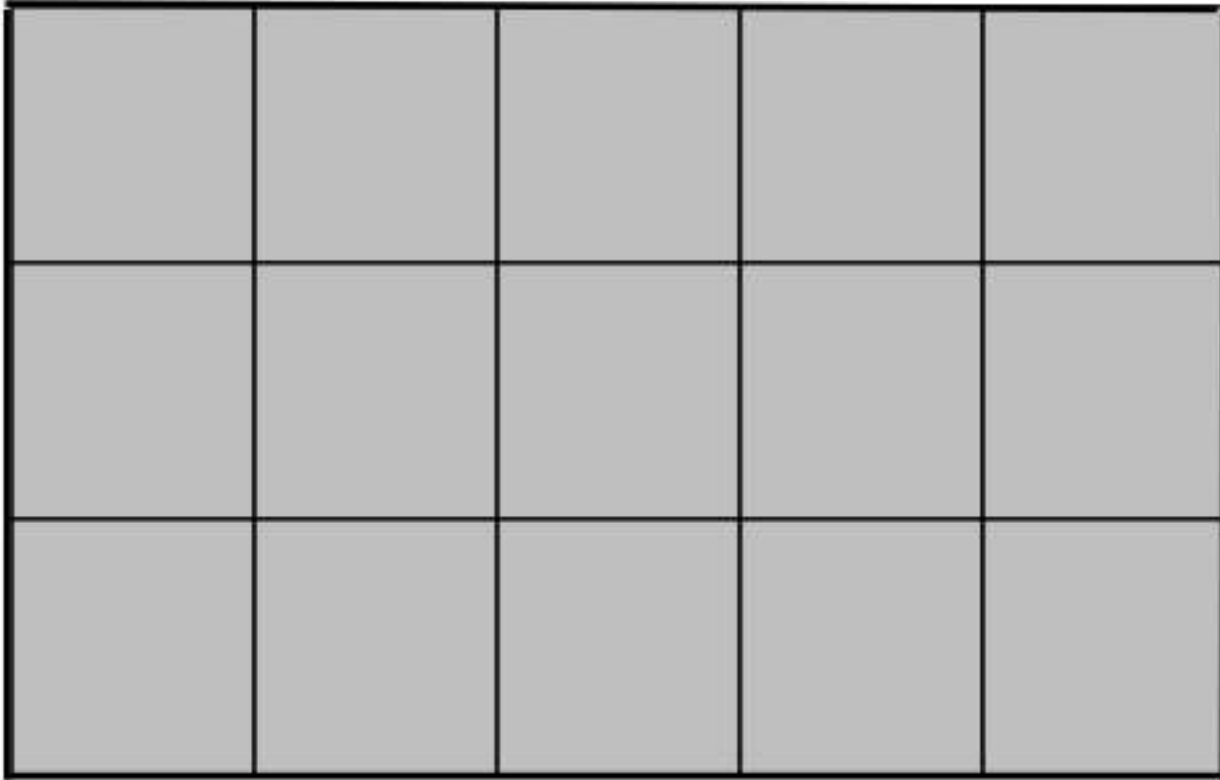
3. Maura uses square-inch tiles to find the side lengths of the rectangle below. Label each side length. Then find the total area.



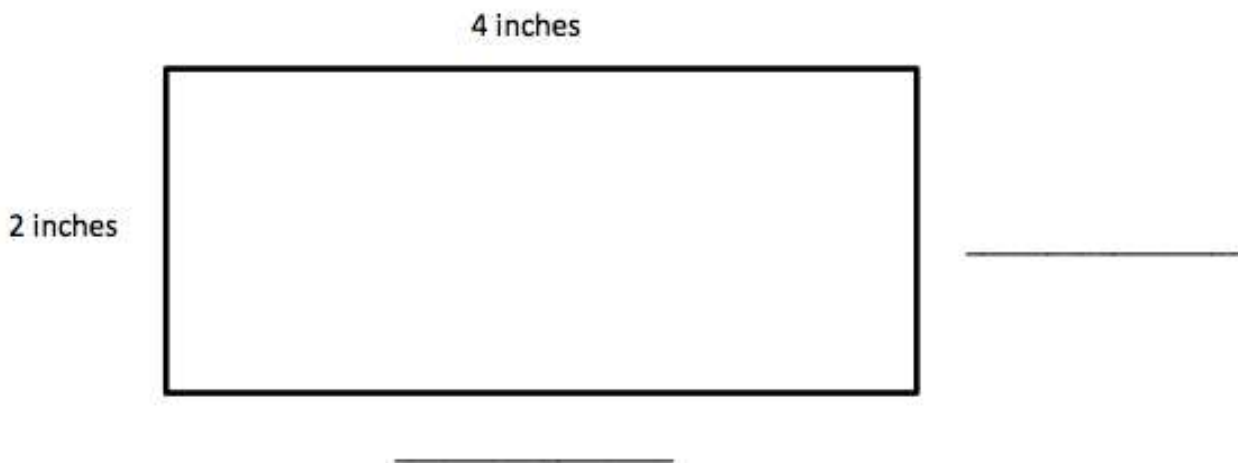
Total area: \_\_\_\_\_



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, then find the area. Explain how you used the lengths provided to find the unknown lengths and area.





## **Grade 3, Module 4: Multiplication and Area**

### **Mission: Find the Area**

#### **Topic B: Concepts of Area Measurement**

Topic B, students progress from using square tile manipulatives to drawing their own area models. Students connect their extensive work with rectangular arrays and multiplication to eventually discover the area formula for a rectangle, which is formally introduced in Grade 4.

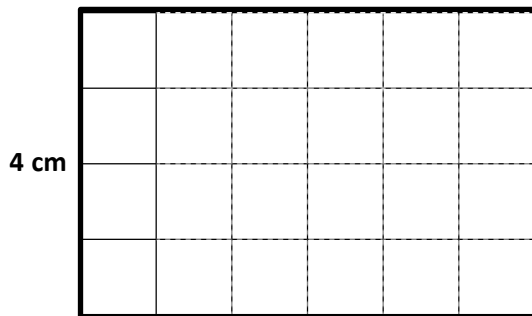
Grade 3 Mission 4 Lesson 5 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

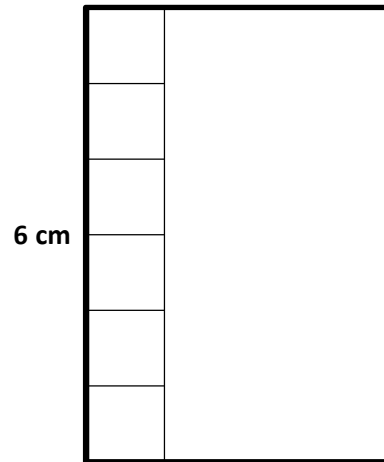
1. Use the centimeter side of a ruler to draw in the tiles, and then skip-count to find the unknown side length or area. Write a multiplication sentence for each tiled rectangle.

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



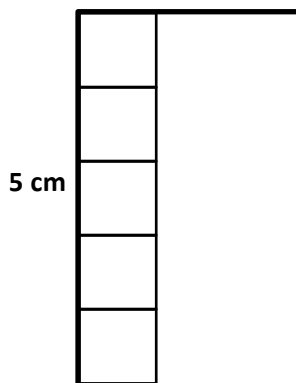
$$\underline{4} \times \underline{\quad} = \underline{24}$$

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



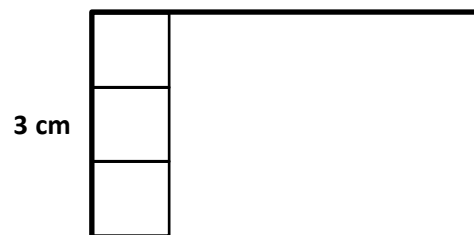
$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

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



$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

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




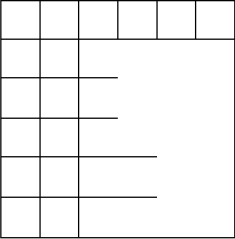
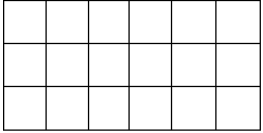
$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

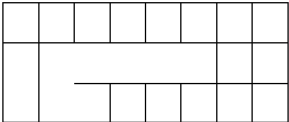
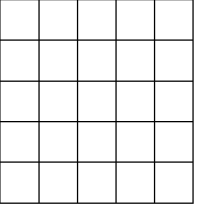


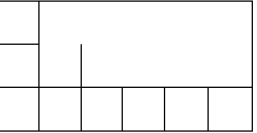
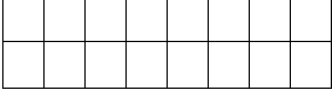
Grade 3 Mission 4 Lesson 6 Homework

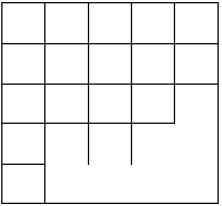
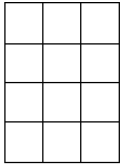
Name: \_\_\_\_\_ Date: \_\_\_\_\_

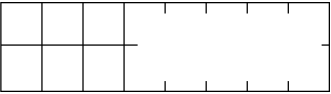
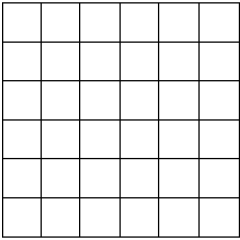
1. Each  represents a 1 cm square. Draw to find the number of rows and columns in each array. Match it to its completed array. Then, fill in the blanks to make a true equation to find each array's area.

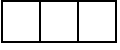
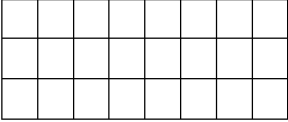
a.   \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ sq cm

b.   \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ sq cm

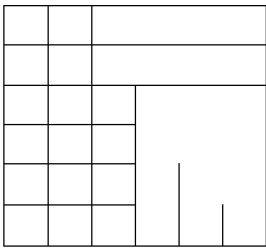
c.   \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ sq cm

d.   \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ sq cm

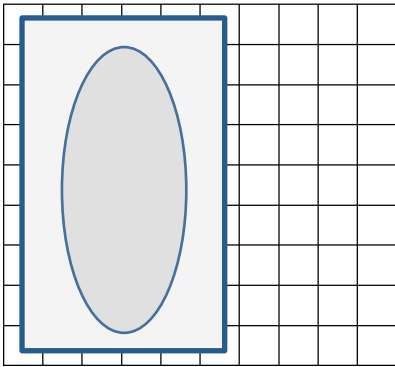
e.   \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ sq cm

f.   \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ sq cm

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.

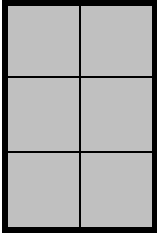
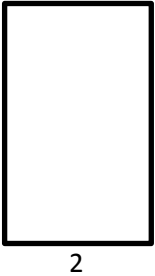
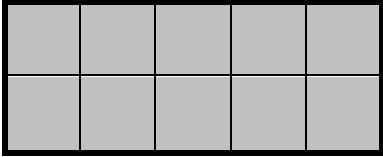

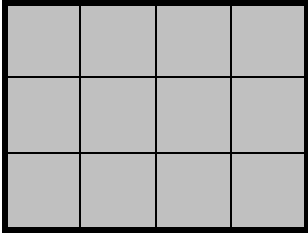

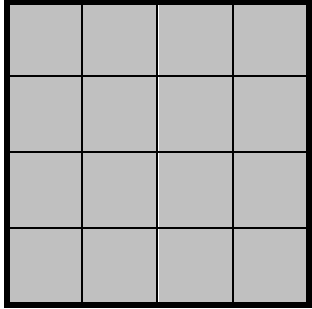
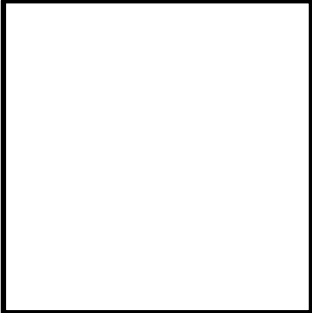


Grade 3 Mission 4 Lesson 7 Homework

Name \_\_\_\_\_

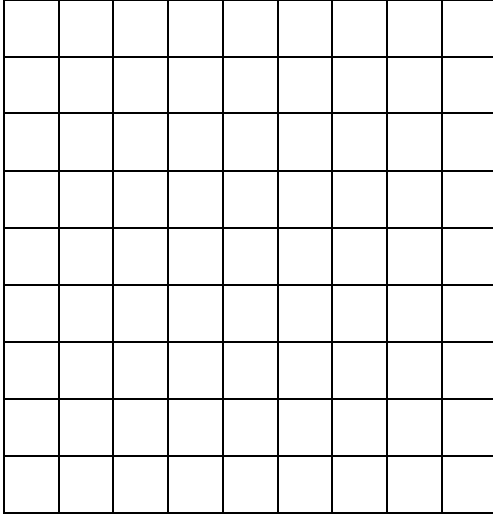
Date \_\_\_\_\_

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.

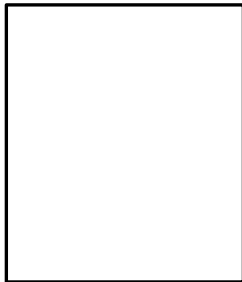
| Rectangular Arrays  | Area Models  |
|---|--|
| <p>a.</p>  <p>_____ square units</p>   |  <p><math>3 \times \underline{\quad} = \underline{\quad}</math></p> |
| <p>b.</p>  <p>_____ square units</p>   |  <p>_____ <math>\times</math> _____ = _____</p>                    |
| <p>c.</p>  <p>_____ square units</p> |  <p>_____ <math>\times</math> _____ = _____</p>                  |
| <p>d.</p>  <p>_____ square units</p> |  <p>_____ <math>\times</math> _____ = _____</p>                  |

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?



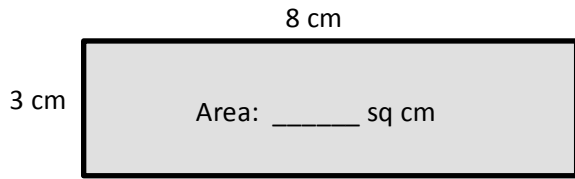
Grade 3 Mission 4 Lesson 8 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

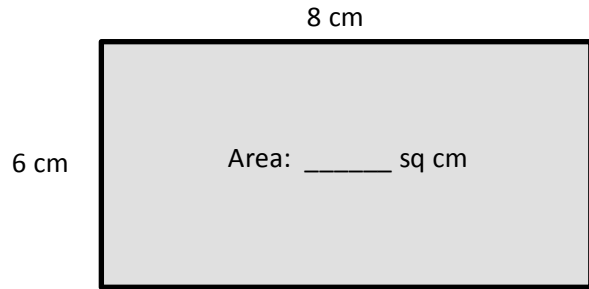
1. Write a multiplication equation to find the area of each rectangle.

a.



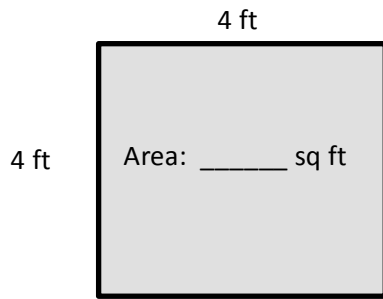
\_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_

b.



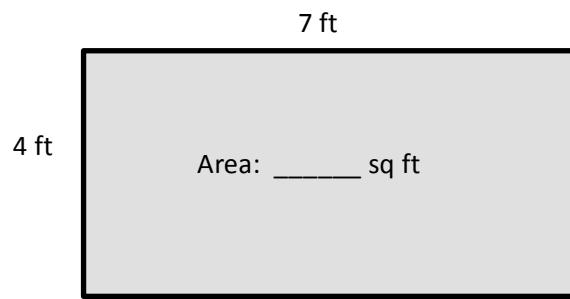
\_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_

c.



\_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_

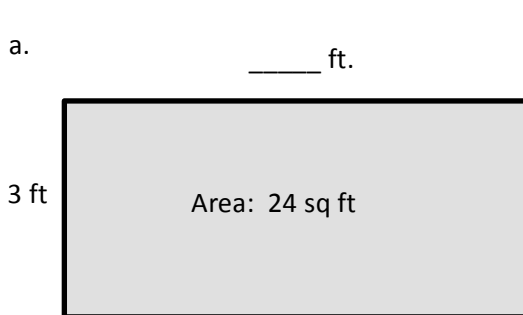
d.



\_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_

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

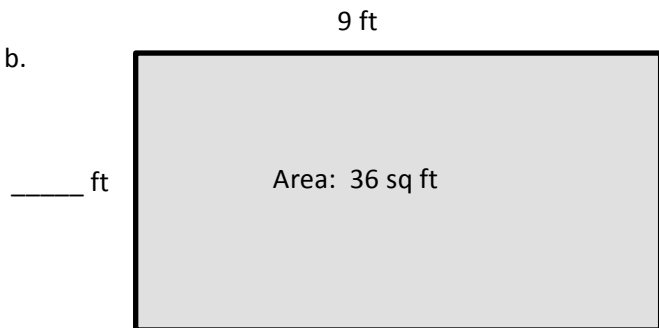
a.



\_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_ ÷ \_\_\_\_\_ = \_\_\_\_\_

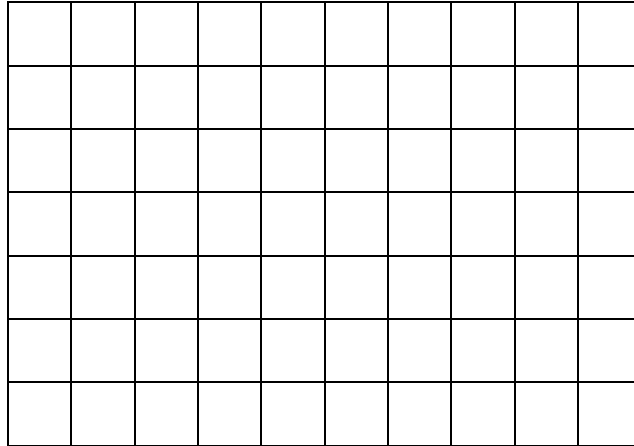
b.



\_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_ ÷ \_\_\_\_\_ = \_\_\_\_\_

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?



## **Grade 3, Module 4: Multiplication and Area**

### **Mission: Find the Area**

#### **Topic C: Arithmetic Properties Using Area Models**

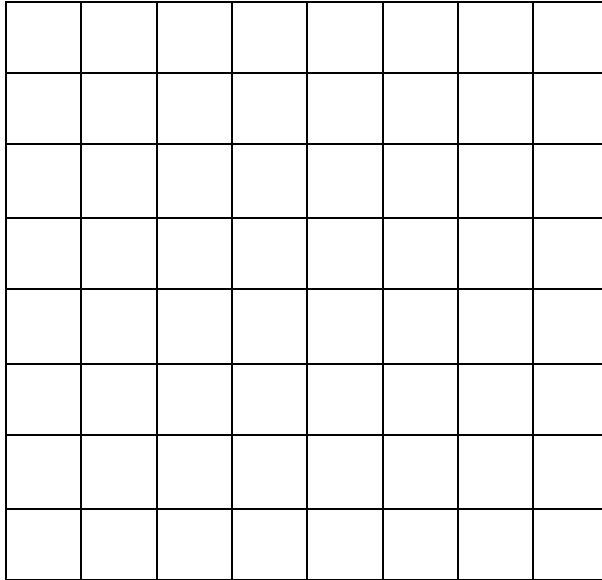
In Topic C, students demonstrate arithmetic properties by manipulating rectangular arrays. Students also apply tiling and multiplication skills to determine all whole number possibilities for the side lengths of rectangles given their areas.

Grade 3 Mission 4 Lesson 9 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Use the grid to answer the questions below.



- Draw a line to divide the grid into 2 equal rectangles. Shade in 1 of the rectangles that you created.
- Label the side lengths of each rectangle.
- Write an equation to show the total area of the 2 rectangles.

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.

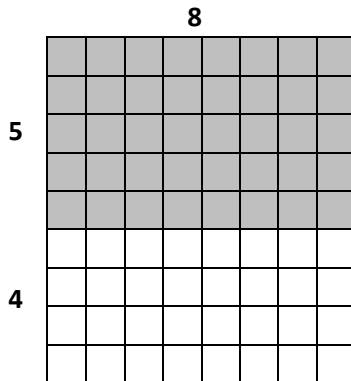
Grade 3 Mission 4 Lesson 10 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

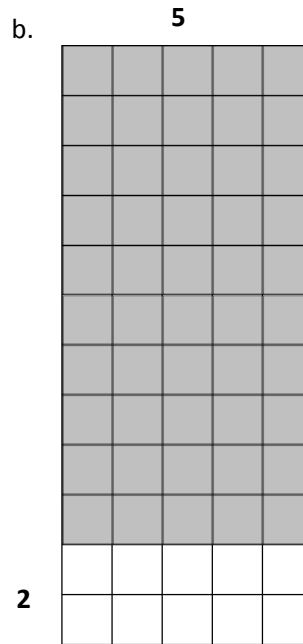
1. Label the side lengths of the shaded and unshaded rectangles. Then, find the total area of the large rectangle by adding the areas of the 2 smaller rectangles.

a.



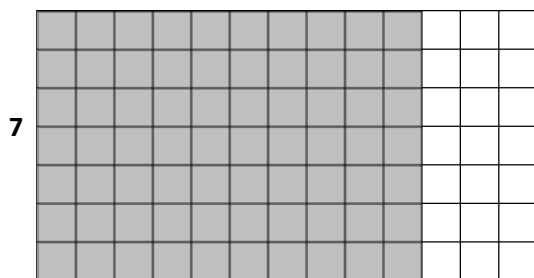
$$\begin{aligned}
 9 \times 8 &= (5 + 4) \times 8 \\
 &= (5 \times 8) + (4 \times 8) \\
 &= \underline{\quad\quad} + \underline{\quad\quad} \\
 &= \underline{\quad\quad} \text{ square units}
 \end{aligned}$$

b.



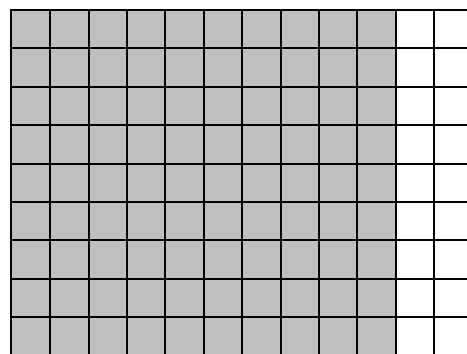
$$\begin{aligned}
 12 \times 5 &= (\underline{\quad\quad} + 2) \times 5 \\
 &= (\underline{\quad\quad} \times 5) + (2 \times 5) \\
 &= \underline{\quad\quad} + 10 \\
 &= \underline{\quad\quad} \text{ square units}
 \end{aligned}$$

c.



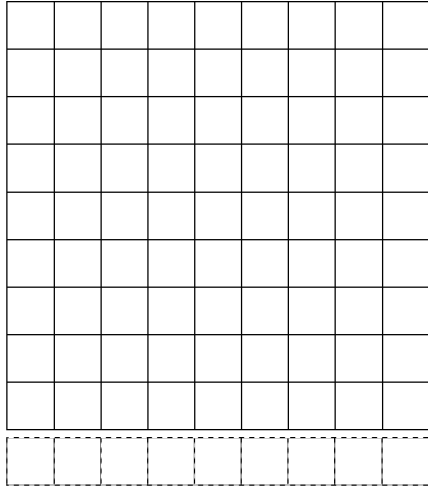
$$\begin{aligned}
 7 \times 13 &= 7 \times (\underline{\quad\quad} + 3) \\
 &= (7 \times \underline{\quad\quad}) + (7 \times 3) \\
 &= \underline{\quad\quad} + \underline{\quad\quad} \\
 &= \underline{\quad\quad} \text{ square units}
 \end{aligned}$$

d.

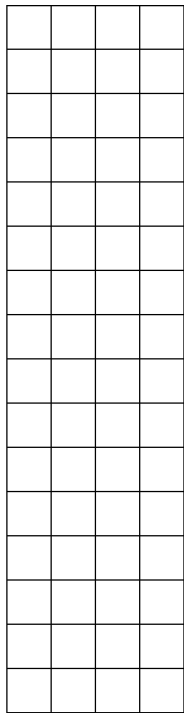


$$\begin{aligned}
 9 \times 12 &= 9 \times (\underline{\quad\quad} + \underline{\quad\quad}) \\
 &= (9 \times \underline{\quad\quad}) + (9 \times \underline{\quad\quad}) \\
 &= \underline{\quad\quad} + \underline{\quad\quad} \\
 &= \underline{\quad\quad} \text{ square units}
 \end{aligned}$$

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



3. Shade an area to break the  $16 \times 4$  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.

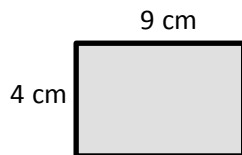


Grade 3 Mission 4 Lesson 11 Homework

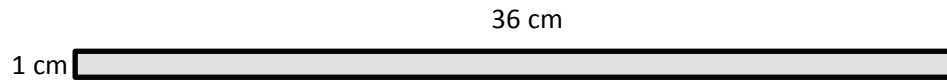
Name \_\_\_\_\_

Date \_\_\_\_\_

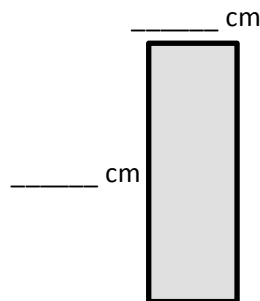
1. The rectangles below have the same area. Move the parentheses to find the missing side lengths. Then, solve.



a. Area:  $4 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$  sq cm



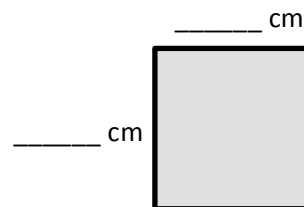
b. Area:  $1 \times 36 = \underline{\hspace{1cm}}$  sq cm



d. Area:  $4 \times 9 = 4 \times (3 \times 3)$   
 $= 4 \times 3 \times 3$   
 $= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$   
 $= \underline{\hspace{1cm}}$  sq cm



c. Area:  $4 \times 9 = (2 \times 2) \times 9$   
 $= 2 \times 2 \times 9$   
 $= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$   
 $= \underline{\hspace{1cm}}$  sq cm

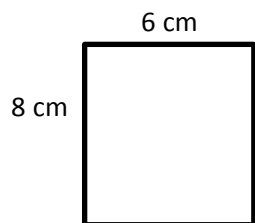


e. Area:  $12 \times 3 = (6 \times 2) \times 3$   
 $= 6 \times 2 \times 3$   
 $= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$   
 $= \underline{\hspace{1cm}}$  sq cm

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?



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?

$$\begin{aligned}
 4 \times 12 &= 4 \times 2 \times 6 \\
 &= 4 \times 2 \times 6 \\
 &= \underline{\quad} \times \underline{\quad} \\
 &= \underline{\quad} \text{ sq cm}
 \end{aligned}$$

- c. Use the expression  $8 \times 6$  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.



## Grade 3, Module 4: Multiplication and Area

### Mission: Find the Area

#### Topic D: Applications of Area Using Side Lengths of Figures

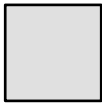
In Topic D, students solve problems involving area. Students also decompose and/or compose composite shapes in order to find the total area of the original shape.

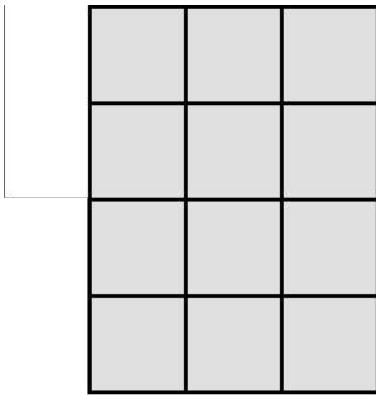
Grade 3 Mission 4 Lesson 12 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

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

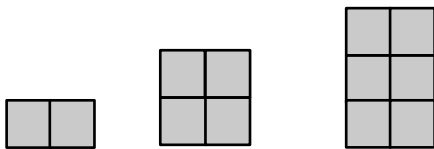
2. Each  is 1 square unit. Sienna uses the same square units to draw a  $6 \times 2$  rectangle and says that it has the same area as the rectangle below. Is she correct? Explain why or why not.



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?

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.

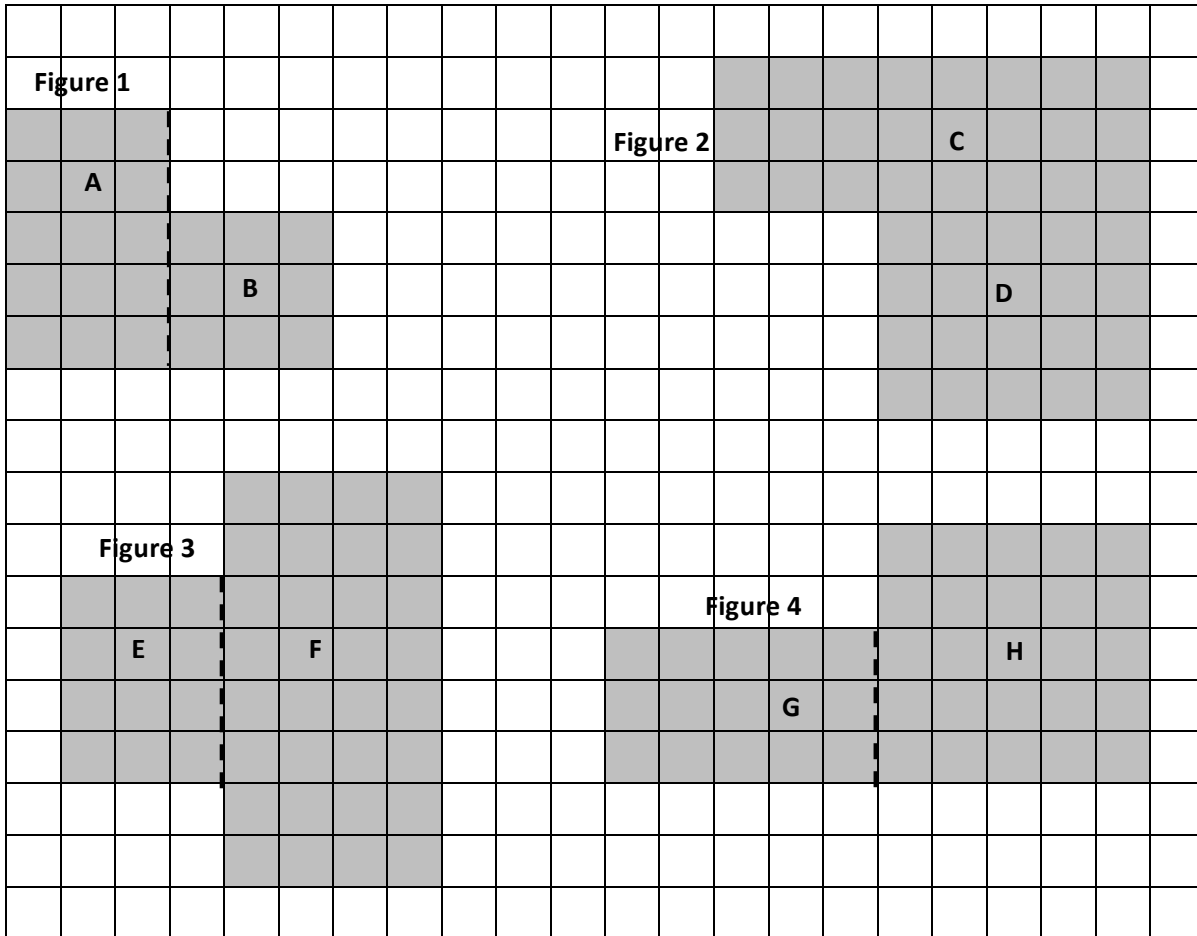


Grade 3 Mission 4 Lesson 13 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

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



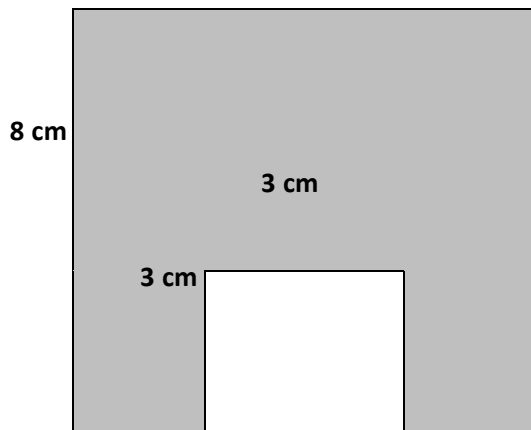
**Figure 1:** Area of A + Area of B: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ sq units

**Figure 2:** Area of C + Area of D: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ sq units

**Figure 3:** Area of E + Area of F: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ sq units

**Figure 4:** Area of G + Area of H: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ sq units

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:

$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ sq cm}$$

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

a. Label the missing measurements.

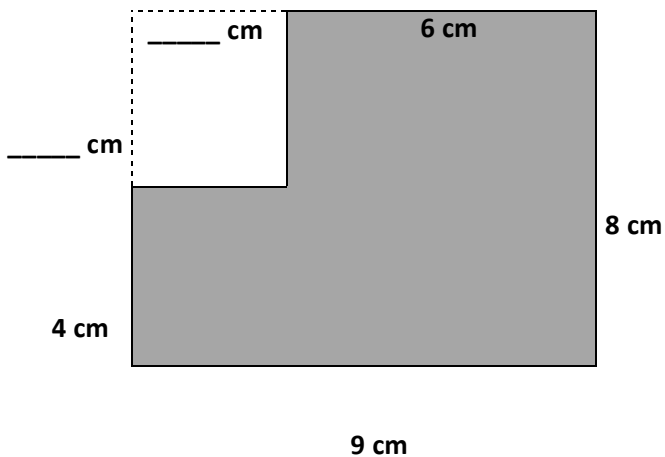
b. Area of the big rectangle:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ sq cm}$$

c. Area of the small rectangle:

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}} \text{ sq cm}$$

d. Find the area of the shaded figure.

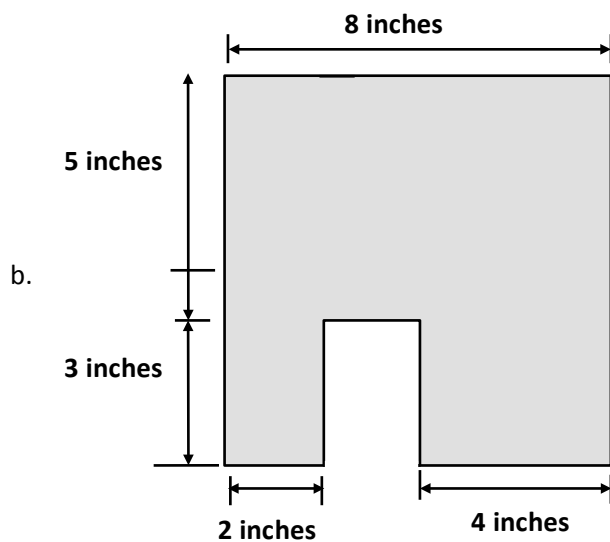
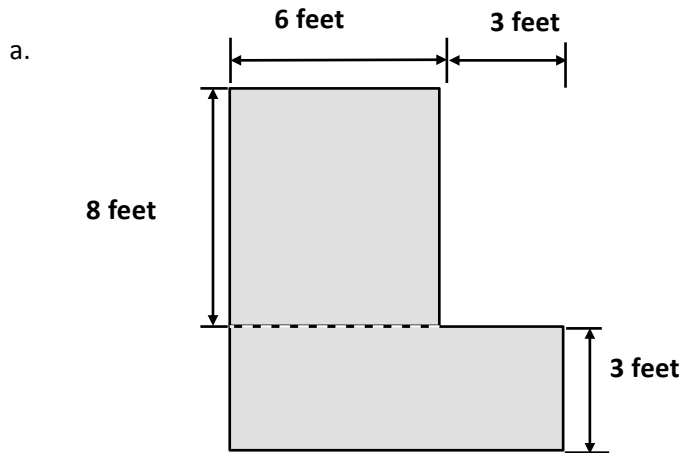


Grade 3 Mission 4 Lesson 14 Homework

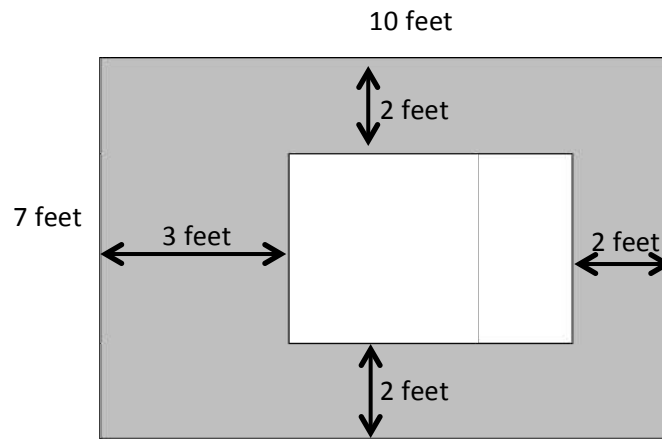
Name \_\_\_\_\_

Date \_\_\_\_\_

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



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.



Name \_\_\_\_\_  
\_\_\_\_\_

Date \_\_\_\_

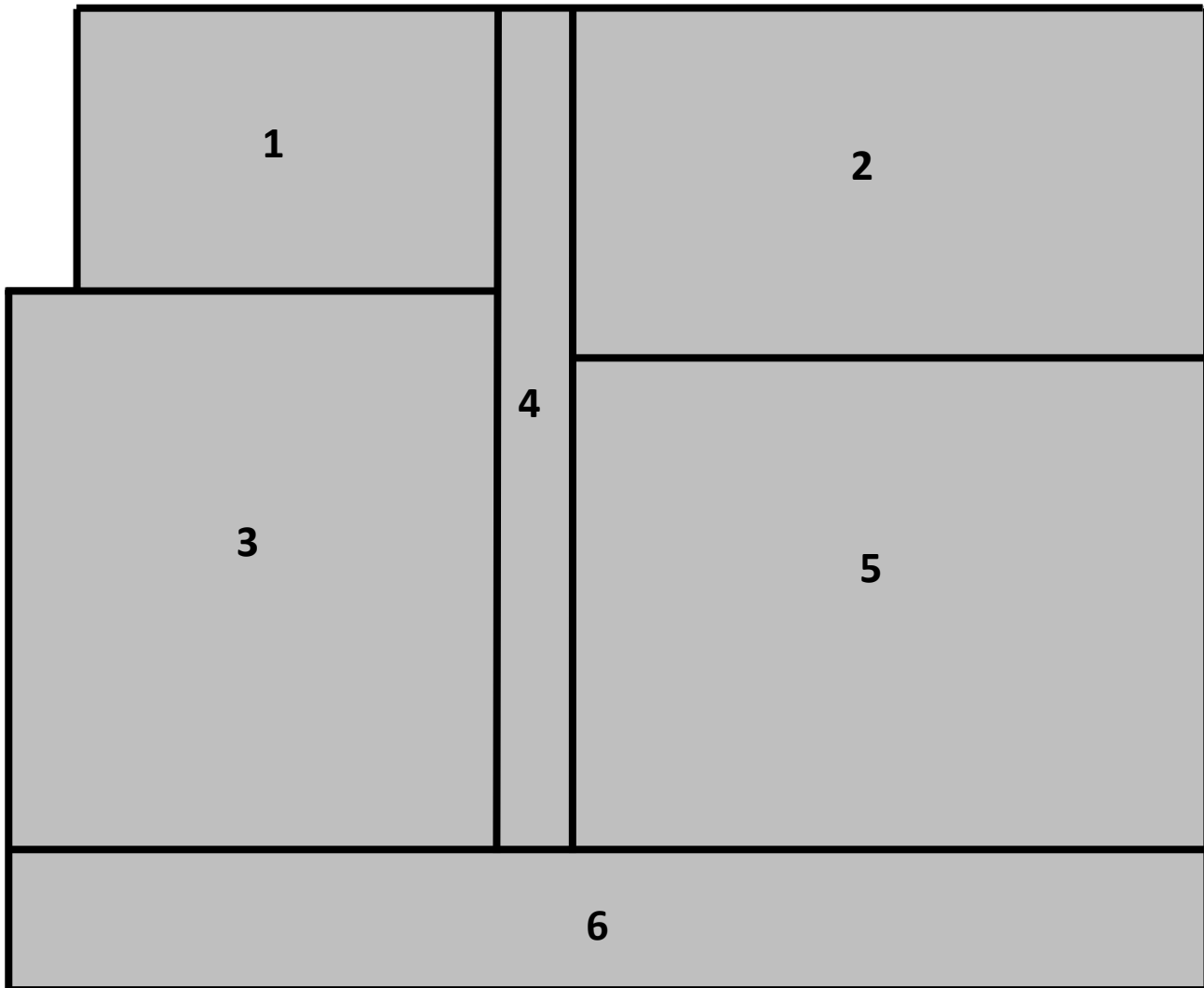
Use a ruler to measure the side lengths of each lettered room in centimeters. Then, find the area. Use the measurements below to match, and label the rooms with the correct areas.

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

Grade 3 Mission 4 Lesson 16 Homework

Name \_\_\_\_\_

Date \_\_\_\_\_

Jeremy plans and designs his own dream playground on grid paper. His new playground will cover a total area of 72 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 |

