# Slicing and Dicing

## Composite Figures

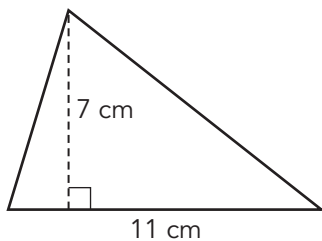**4**

## WARM UP

Use a formula to determine the area of each figure.

1.
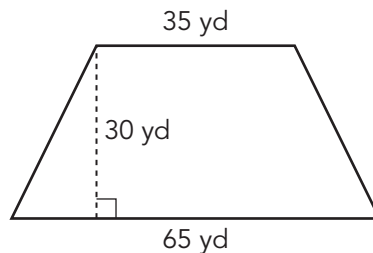
$10\frac{1}{2}$ m

22 m

2.

7 cm

11 cm

3.

35 yd

30 yd

65 yd
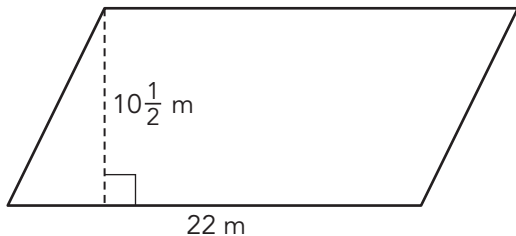
## LEARNING GOALS

- Decompose composite geometric figures into rectangles, parallelograms, and/or triangles to determine their areas.
- Solve real-world problems by composing and decomposing shapes into triangles and rectangles.

## KEY TERM

- composite figure

You know how to calculate the area of triangles, rectangles, parallelograms, and trapezoids. How can you use what you know about the areas of these shapes to determine areas of more complex shapes?
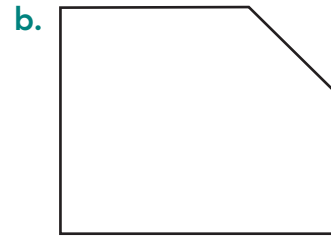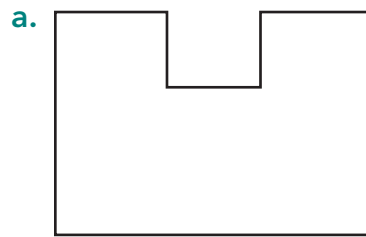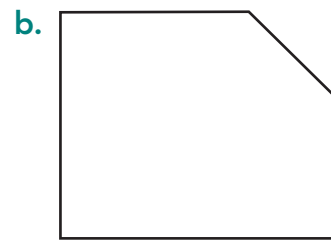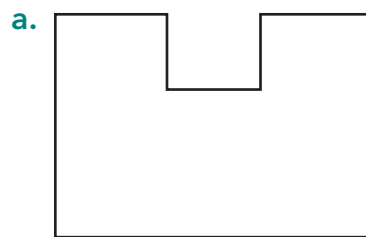
## Compose or Decompose?

Consider each composite figure shown.

A **composite figure** is a figure that is made up of more than one geometric figure.

**1.** Show how you could decompose each figure into two or more familiar figures. Describe the shapes that make up the composite figure.

a.

b.

**2.** Show how you could compose each figure into a larger, familiar figure. Describe the shapes that make up the composite figure.

a.

b.

Consider the blueprint of a floor plan for a kitchen, dining room, and living room combination.
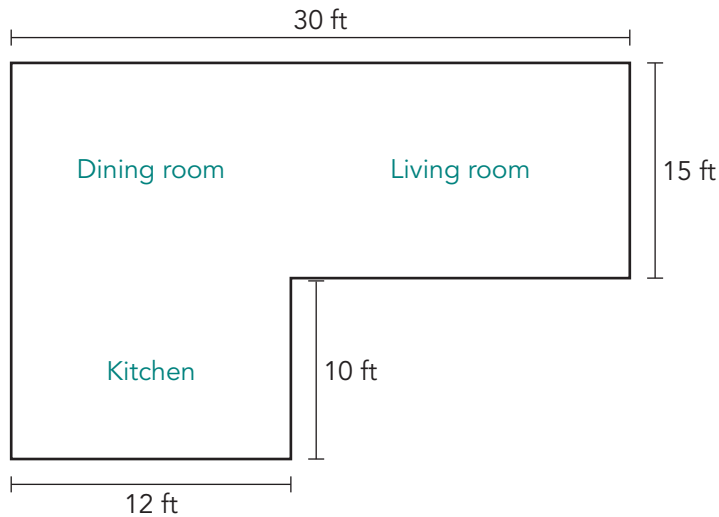


3. Suppose the homeowner wants to replace the floors in all the rooms.

   a. Wanda says she can determine the total area of flooring needed by decomposing the blueprint into two rectangles. Naveed says he can determine the total area of flooring needed by composing the blueprint into one large rectangle and then subtracting the unused area. Who is correct?
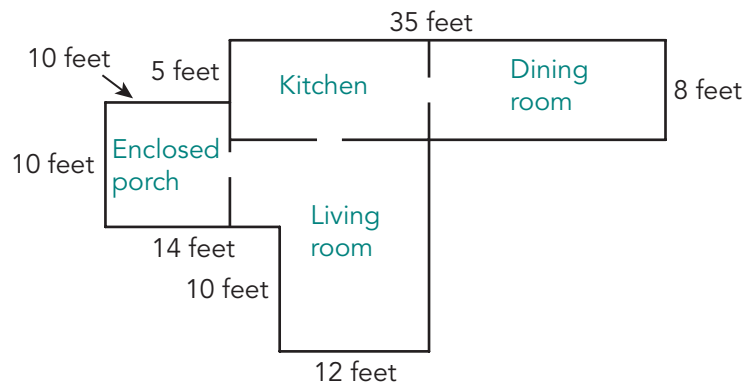
   b. Show how to calculate the amount of flooring needed using Wanda's method.

   c. Show how to calculate the amount of flooring needed using Naveed's method.

# Area of Composite Figures

Solve each problem. Show your work.

1. **Suppose that carpeting costs $1.20 per square foot. How much would it cost to carpet every room in this house, except the kitchen?**



2. **Suppose a gallon of paint covers about 400 square feet. How much paint would you need to paint the entire back of this house?**

> Be sure that the simpler figures you draw do not have overlapping areas.
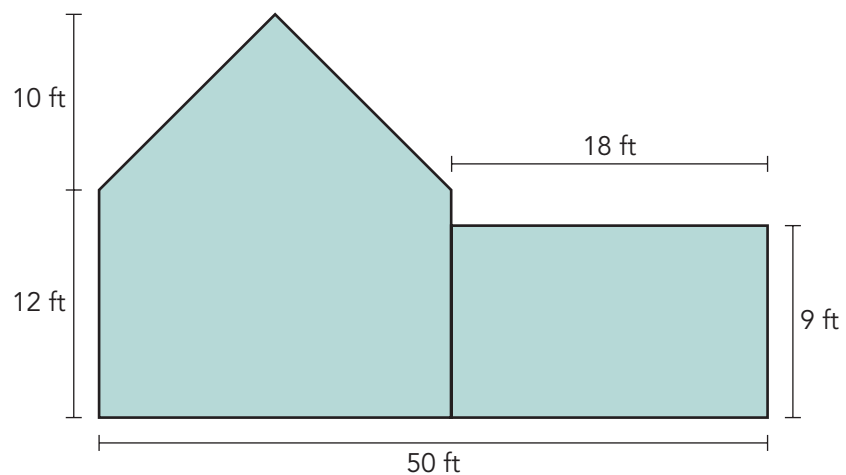
3. Tanner is spray painting an arrow on the side of a building to point to the entrance of his store. The can of gold spray paint he wants to use covers up to 12 square feet. Does Tanner have enough spray paint for his arrow?
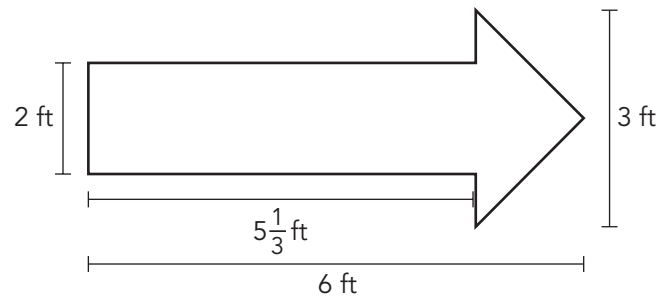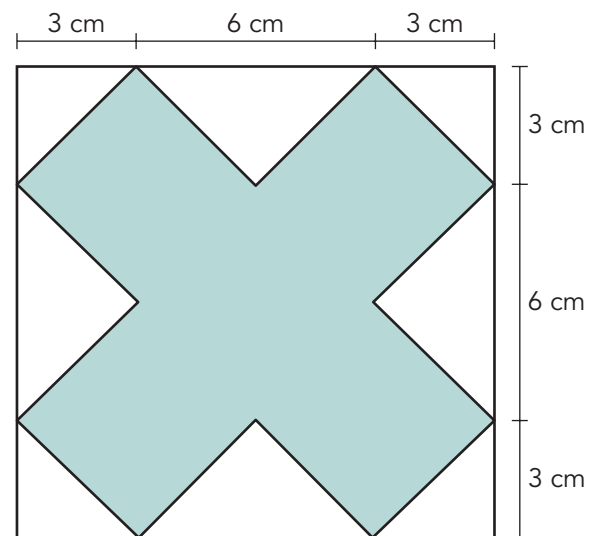


Determine the area of the shaded region in each figure. Show your work.

4. A right triangle and a trapezoid are drawn within a rectangle to create the shaded region in the figure.
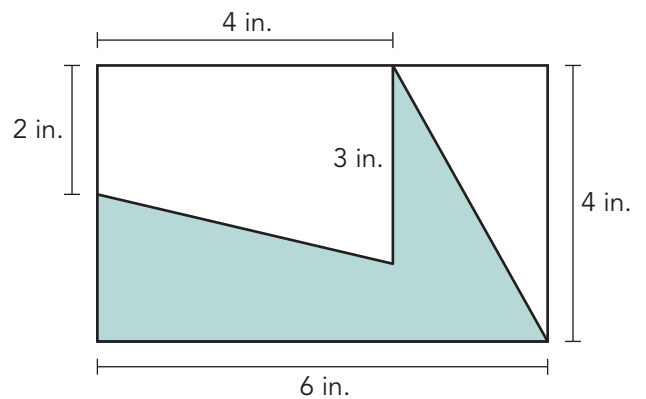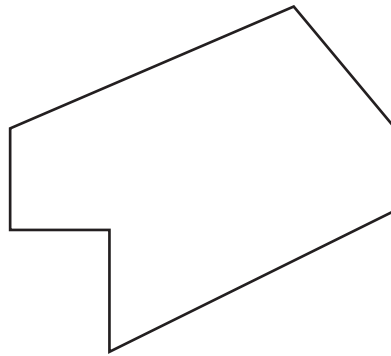


5. Eight triangles are drawn within a square to create the shaded region in the figure.

# Area of Complex Figures

You can divide more complex figures with oddly-figured regions into smaller, familiar regions to calculate the approximate area.

1. **Draw lines in the figure to divide the figure into smaller, familiar figures. Then, name the familiar figures that make up the total figure.**
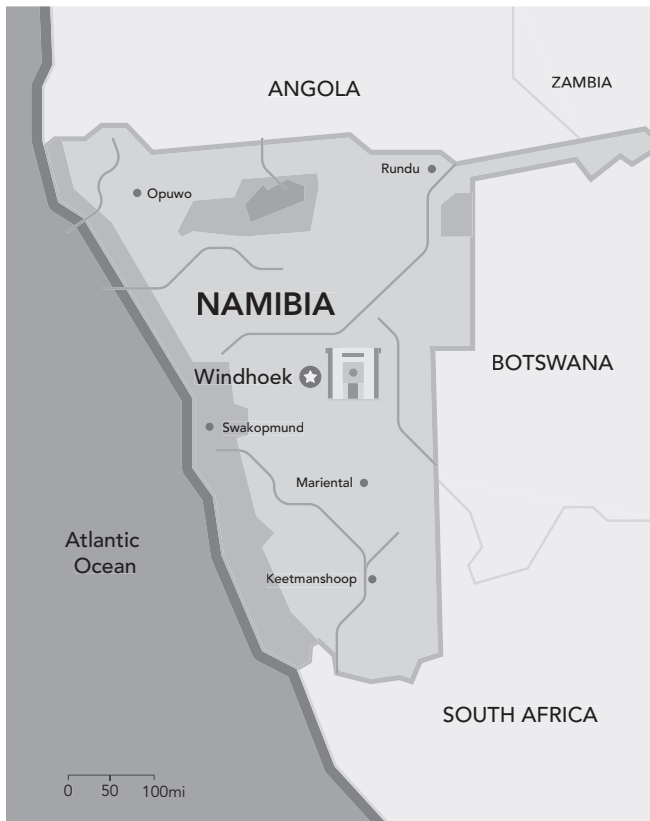
2. **Determine the area of each complex figure.**

a.

4 cm

5 cm

7 cm

2 cm   4 cm

15 cm

10 cm

5 cm

4 cm

8 cm

b.

3 cm

4 cm

5 cm

9 cm

4 cm

6 cm
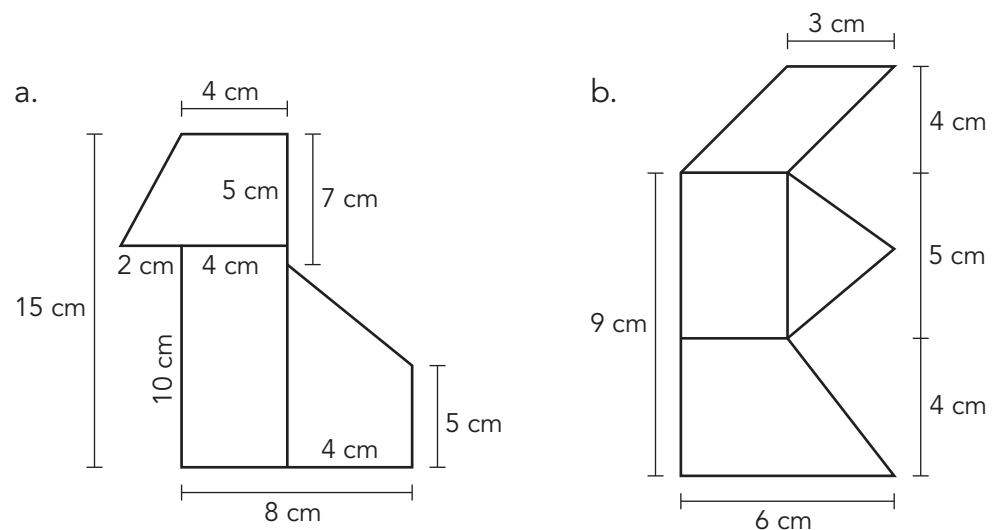
## 3. Estimate the area of France.



## 4. Estimate the area of Namibia.

## TALK the TALK

## Use Your Powers of Mathematical Reasoning

Sometimes a figure you are already familiar with is divided into smaller figures. You can use what you know about the areas of these figures to determine the area of a specific region.

1. **Determine the area of the shaded triangle inside the square. Explain your strategy.**
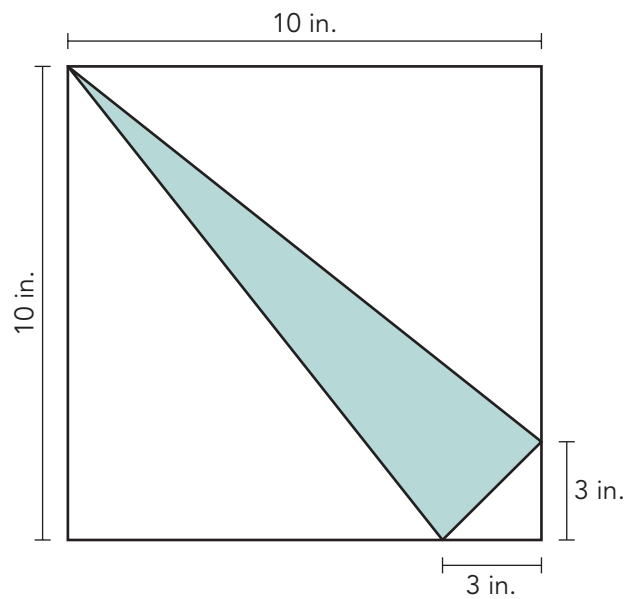


Create a presentation of your solution strategy for the class.