



TABE Math-E

PAXEN

Unit-6 Geometry

Lesson 48

Decompose Area

Revised: November 4, 2023

Nolan Tombouliau

Some graphics may not have copied well during the scan process.

Math-E - Lesson 48 – Decompose Area

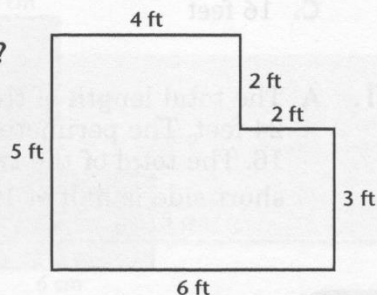
Lesson 48

Decompose Shapes to Determine Area

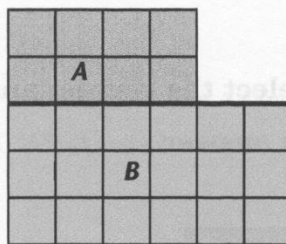
3.G.2 – Low, 3.MD.7.c – High, 3.MD.7.d – High

Sometimes you may need to determine the area of a shape that is not a rectangle. You can do this by dividing the shape into rectangular sections and adding the areas together.

Example Luca is planting a garden. Each plant requires 1 square foot. What is the total area of the garden? How many plants can he fit in the garden?



1) Divide the shape into two rectangles.



2) Find the area of each rectangle.

$$\text{Rectangle A: } 4 \text{ ft} \times 2 \text{ ft} = 8 \text{ ft}^2$$

$$\text{Rectangle B: } 6 \text{ ft} \times 3 \text{ ft} = 18 \text{ ft}^2$$

3) Add the areas.

$$8 \text{ ft}^2 + 18 \text{ ft}^2 = 26 \text{ ft}^2$$

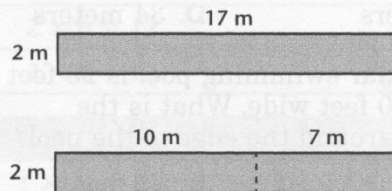
4) Determine how many $1 \text{ ft} \times 1 \text{ ft}$ sections he can fit in the garden.

The garden can be divided into 26 $1 \text{ ft} \times 1 \text{ ft}$ sections. Each section is $\frac{1}{26}$ of the garden.

The area of the garden is 26 square feet. Each square foot is $\frac{1}{26}$ of the garden, so he can fit 26 plants.

Sometimes it is easier to find the area of a rectangle by splitting it into two smaller rectangles and adding their areas.

Example What is the area of this rectangle?



1) Divide the rectangle into two smaller rectangles with easier numbers. Since $17 = 10 + 7$, you can divide this rectangle into a 2 by 10 rectangle and a 2 by 7 rectangle. $2 \times (10 + 7)$ is the same as 2×17 .

2) Find the area of each rectangle.

$$2 \text{ m} \times 10 \text{ m} = 20 \text{ m}^2$$

$$2 \text{ m} \times 7 \text{ m} = 14 \text{ m}^2$$

3) Add the areas.

$$20 \text{ m}^2 + 14 \text{ m}^2 = 34 \text{ m}^2$$

The area of the rectangle is 34 square meters.

Math-E - Lesson 48 – Decompose Area

Test Example

1. Jane has a $10 \text{ ft} \times 8 \text{ ft}$ garden. She wants to grow tomatoes and peppers. She needs more space for the tomato plants than for the peppers. How can she divide the garden?

- A. 10 feet by 4 feet and 4 feet by 10 feet rectangles
- B. 10 feet by 3 feet and 10 feet by 5 feet rectangles
- C. 8 feet by 5 feet and 5 feet by 8 feet rectangles
- D. 3 feet by 10 feet and 7 feet by 10 feet rectangles

1. B $10 \times 8 = 80 \text{ ft}^2$. The two rectangles need to be different sizes. $10 \times 3 = 30$, and $10 \times 5 = 50$. $30 + 50 = 80 \text{ ft}^2$.

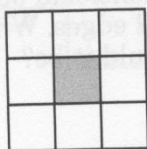
Strategy

Draw and label a picture to help make sense of the problem.

Practice

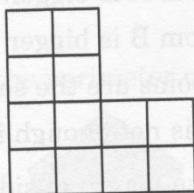
Read each question. Select the correct answer.

1 The gray square represents what part of the rectangle's area?



- A. $\frac{1}{3}$
- B. $\frac{2}{3}$
- C. $\frac{1}{9}$
- D. $\frac{8}{9}$

2 Each square is one square inch. What is the area of this shape?

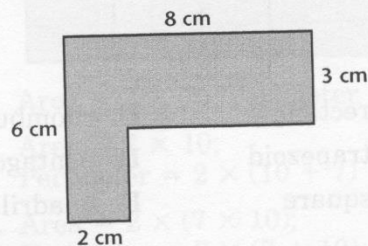


- A. 4 in.^2
- B. 8 in.^2
- C. 12 in.^2
- D. 16 in.^2

3 Hal has painted 60 square feet of a wall. The wall is 10 feet by 10 feet. How much area is left to be painted?

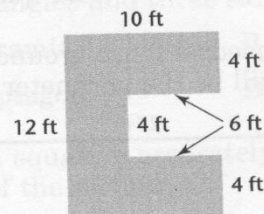
- A. 30 square feet
- B. 40 square feet
- C. 60 square feet
- D. 90 square feet

4 What is the area of this shape?



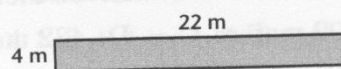
- A. 19 cm^2
- B. 30 cm^2
- C. 36 cm^2
- D. 48 cm^2

5 What is the area of this shape?



- A. 40 ft^2
- B. 48 ft^2
- C. 80 ft^2
- D. 96 ft^2

6 What is the area of this rectangle?



- A. 26 m^2
- B. 32 m^2
- C. 84 m^2
- D. 88 m^2

Math-E - Lesson 48 – Decompose Area

Lesson 48

Decompose Shapes to Determine Area

(3.G.2, 3.MD.7.c, 3.MD.7.d)

- 1. C.** The rectangle has 9 square units. One square unit is $\frac{1}{9}$ of the rectangle's area.
- 2. C.** There are 12 squares. The area is 12 square inches.
- 3. B.** The total area of the wall is 10×10 , or 100 square feet. $100 - 60 = 40$ square feet.
- 4. B.** The shape can be divided into two rectangles. $6 \times 2 = 12$; $6 \times 3 = 18$; $12 + 18 = 30$ square centimeters.
- 5. D.** The shape can be divided into three rectangles. The small rectangle is 4×4 , or 16 square feet. The two larger rectangles are each 10×4 , or 40 square feet. $16 + 40 + 40 = 96$ square feet.
- 6. D.** The rectangle can be divided into two smaller rectangles, 4×20 and 4×2 . $4 \times 20 = 80$; $4 \times 2 = 8$; $80 + 8 = 88$ square meters.

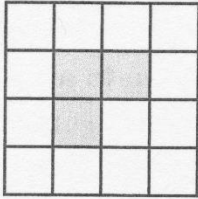
Math-E - Practice 48 – Decompose Area

Practice 48

Decompose Shapes to Determine Area

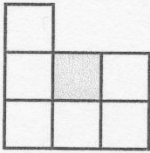
3.G.2 – Low, 3.MD.7.c – High, 3.MD.7.d – High

- 1 The shaded squares represent what part of the rectangle's area?



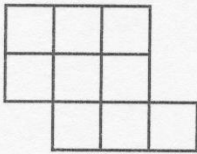
- A. $\frac{3}{13}$ B. $\frac{3}{16}$
C. $\frac{1}{16}$ D. $\frac{1}{8}$

- 2 The shaded square represents what part of the shape's area?



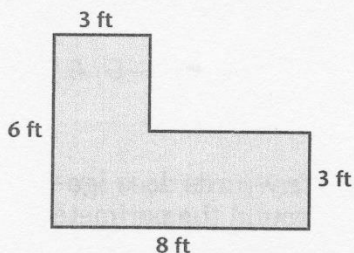
- A. $\frac{1}{7}$ B. $\frac{2}{7}$
C. $\frac{3}{7}$ D. $\frac{6}{7}$

- 3 Each square is one square centimeter. What is the area of this shape?



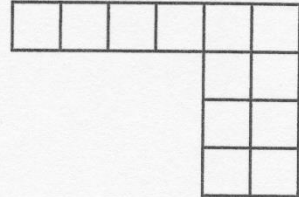
- A. 6 cm^2 B. 7 cm^2
C. 8 cm^2 D. 9 cm^2

- 4 What is the area of this shape?



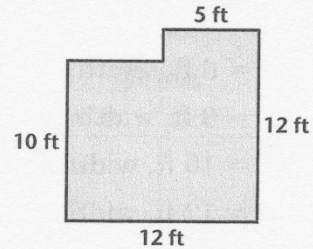
- A. 33 ft^2 B. 30 ft^2
C. 24 ft^2 D. 20 ft^2

- 5 Haben lays paving stones in a path in his garden. Each paving stone is one square foot. What is the area of Haben's stone path?



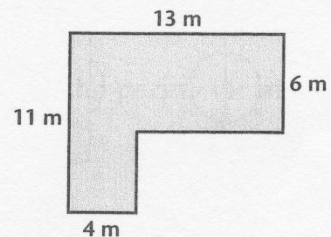
- A. 15 ft^2
B. 14 ft^2
C. 13 ft^2
D. 12 ft^2

- 6 Guadalupe measures her office because she is having new carpet installed. How many square feet of carpet does Guadalupe need to buy?



- A. 120 ft^2
B. 124 ft^2
C. 130 ft^2
D. 144 ft^2

- 7 A lifeguard ropes off the boundaries of the swimming area at a lake. What is the area of the designated swimming zone?



- A. 44 m^2 B. 98 m^2
C. 140 m^2 D. 143 m^2

Math-E - Practice 48 – Decompose Area

- 8 Ji-hoon wants to lay sod in his yard. One part of his yard measures 3 yards by 5 yards. This is attached to another part of his yard that measures 2 yards by 4 yards. How many square yards of sod should Ji-hoon buy to cover the total area of his yard?

A. 8 yd^2 B. 15 yd^2
C. 20 yd^2 D. 23 yd^2

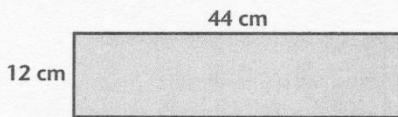
- 9 The Parks and Recreation Department of Sunnyville approves plans for a new dog park with separate spaces for large and small dogs. The space for large dogs measures 20 yards by 30 yards, and the space for small dogs measures 10 yards by 5 yards. What is the total area of the proposed dog park?

A. 650 yd^2 B. 600 yd^2
C. 110 yd^2 D. 50 yd^2

- 10 Minji consults a landscape architect to redesign her backyard. The plans include a new concrete patio. The space for a sitting area measures 8 feet by 12 feet and the connected grilling area measures 6 feet by 6 feet. What is the total area of Minji's new patio?

A. 36 ft^2 B. 96 ft^2
C. 132 ft^2 D. 144 ft^2

- 11 Which two expressions can be used to find the area of this shape?



A. $(4 \times 4) + (10 \times 2)$
B. $(6 \times 44) + (6 \times 44)$
C. $(12 \times 40) + (12 \times 4)$
D. $(12 \times 44) + (12 \times 12)$
E. $(40 \times 4) + (6 \times 6)$
F. $(44 \times 2) + (44 \times 12)$

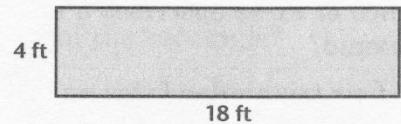
- 12 Jafari is installing wallpaper. The wall is 12 feet by 8 feet. Jafari bought 120 square feet of wallpaper. How much wallpaper will be left over?

A. 96 ft^2 B. 88 ft^2
C. 24 ft^2 D. 12 ft^2

- 13 Martha is a member of her senior community's sewing club. She buys one piece of fabric that is 3 yards by 1 yard. She buys another piece of fabric that is 6 yards by 2 yards. What is the total area of the fabric Martha buys?

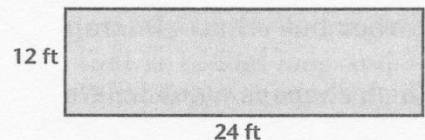
A. 3 yd^2
B. 6 yd^2
C. 12 yd^2
D. 15 yd^2

- 14 Charles buys a long table for his company's boardroom. What is the area of the table Charles buys?



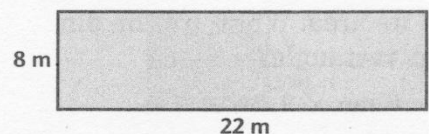
A. 72 ft^2
B. 54 ft^2
C. 40 ft^2
D. 32 ft^2

- 15 Kadeesha installs a pool cover for her rectangular pool. What is the area of Kadeesha's pool?



A. 144 ft^2
B. 288 ft^2
C. 480 ft^2
D. 576 ft^2

- 16 Tavon measures the area of the tennis court at the park to see whether it is regulation size. What is the area of the tennis court Tavon measures?



A. 80 m^2
B. 88 m^2
C. 160 m^2
D. 176 m^2

Math-E - Practice 48 – Decompose Area

Practice 48

Decompose Shapes to Determine Area

pp. 38–39

(3.G.2, 3.MD.7.c, 3.MD.7.d)

1. B. The rectangle has 16 square units. Three square units, or $\frac{3}{16}$, are shaded.
2. A. The shape has 7 square units. One square unit is $\frac{1}{7}$ of the shape's area.
3. D. There are 9 squares. The area is 9 cm^2 .
4. A. The shape can be divided into two rectangles:
 $3 \text{ ft} \times 6 \text{ ft} = 18 \text{ ft}^2$; $3 \text{ ft} \times 5 \text{ ft} = 15 \text{ ft}^2$;
 $18 \text{ ft}^2 + 15 \text{ ft}^2 = 33 \text{ ft}^2$.
5. D. There are 12 squares. The area of Haben's stone path is 12 square feet.
6. C. The shape can be divided into two rectangles:
 $10 \text{ ft} \times 12 \text{ ft} = 120 \text{ ft}^2$; $2 \text{ ft} \times 5 \text{ ft} = 10 \text{ ft}^2$;
 $120 \text{ ft}^2 + 10 \text{ ft}^2 = 130 \text{ ft}^2$. Guadalupe needs to buy 130 square feet of carpet.
7. B. The shape can be divided into two rectangles:
 $13 \text{ m} \times 6 \text{ m} = 78 \text{ m}^2$; $5 \text{ m} \times 4 \text{ m} = 20 \text{ m}^2$;
 $78 \text{ m}^2 + 20 \text{ m}^2 = 98 \text{ m}^2$. The area of the swimming zone is 98 square meters.
8. D. $3 \text{ yd} \times 5 \text{ yd} = 15 \text{ yd}^2$; $2 \text{ yd} \times 4 \text{ yd} = 8 \text{ yd}^2$;
 $15 \text{ yd}^2 + 8 \text{ yd}^2 = 23 \text{ yd}^2$; Ji-hoon should buy 23 square yards of sod.
9. A. $20 \text{ yd} \times 30 \text{ yd} = 600 \text{ yd}^2$;
 $10 \text{ yd} \times 5 \text{ yd} = 50 \text{ yd}^2$;
 $600 \text{ yd}^2 + 50 \text{ yd}^2 = 650 \text{ yd}^2$;
The total area of the proposed dog park is 650 square yards.
10. C. $8 \text{ ft} \times 12 \text{ ft} = 96 \text{ ft}^2$; $6 \text{ ft} \times 6 \text{ ft} = 36 \text{ ft}^2$;
 $96 \text{ ft}^2 + 36 \text{ ft}^2 = 132 \text{ ft}^2$; The total area of Minji's new patio is 132 square feet.
11. B, C. Use the Distributive Property of Multiplication.
The number 12 can be restated as $(6 + 6)$, so the area is $(6 + 6) \times 44 = (6 \times 44) + (6 \times 44)$.
The number 44 can be restated as $(40 + 4)$, so the area is
 $12 \times (40 + 4) = (12 \times 40) + (12 \times 4)$.
12. C. $12 \text{ ft} \times 8 \text{ ft} = 96 \text{ ft}^2$; $120 \text{ ft}^2 - 96 \text{ ft}^2 = 24 \text{ ft}^2$;
There will be 24 square feet of wallpaper left over.
13. D. $3 \text{ yd} \times 1 \text{ yd} = 3 \text{ yd}^2$; $6 \text{ yd} \times 2 \text{ yd} = 12 \text{ yd}^2$;
 $3 \text{ yd}^2 + 12 \text{ yd}^2 = 15 \text{ yd}^2$; The total area of the fabric Martha buys is 15 square yards.
14. A. The rectangle can be divided into two smaller rectangles: $4 \text{ ft} \times 10 \text{ ft} = 40 \text{ ft}^2$; $4 \text{ ft} \times 8 \text{ ft} = 32 \text{ ft}^2$;
 $40 \text{ ft}^2 + 32 \text{ ft}^2 = 72 \text{ ft}^2$. The area of the table Charles buys is 72 square feet.
15. B. The rectangle can be divided into two smaller rectangles: $12 \text{ ft} \times 12 \text{ ft} = 144 \text{ ft}^2$; $12 \text{ ft} \times 12 \text{ ft} = 144 \text{ ft}^2$;
 $144 \text{ ft}^2 + 144 \text{ ft}^2 = 288 \text{ ft}^2$. The area of Kadeesha's pool is 288 square feet.
6. D. The rectangle can be divided into two smaller rectangles: $8 \text{ m} \times 11 \text{ m} = 88 \text{ m}^2$; $8 \text{ m} \times 11 \text{ m} = 88 \text{ m}^2$;
 $88 \text{ m}^2 + 88 \text{ m}^2 = 176 \text{ m}^2$. The area of the tennis court is 176 square meters.