

Area and Perimeter: practice solutions, Grade 3 – download the PDF

Written solutions to the chapter problems. Check each step, then correct yourself.

1 Count the squares



There are 3 rows, and each row has 5 squares: $5 + 5 + 5 = 15$.

The area is 15 square centimeters.

2 Floor tiles in a hallway



(a) $3 \times 9 = 27$. She uses 27 tiles.

(b) Each tile is 1 square foot, so the area is 27 square feet.

3 Brownie pan



(a) $4 \times 6 = 24$.

(b) Each brownie is 1 square inch, so the area of the pan is 24 square inches. (Turning the pan gives $6 \times 4 = 24$, the same area.)

4 Areas of rectangles



(a) $6 \times 3 = 18$, so 18 square centimeters.

(b) $8 \times 5 = 40$, so 40 square inches.

(c) $7 \times 2 = 14$, so 14 square meters.

5 Areas of squares



(a) $5 \times 5 = 25$. The area is 25 square inches.

(b) $8 \times 8 = 64$. The area is 64 square centimeters.

6 Perimeter of a triangle



Add all three sides: $7 + 9 + 6 = 22$.

The perimeter is 22 inches.

7 A garden bed



(a) $9 \times 4 = 36$. The area is 36 square feet.

(b) $9 + 4 + 9 + 4 = 26$. The perimeter is 26 feet.

Notice that the units are different: square feet for area, feet for perimeter.

8 The missing side of a rectangle



We need the number that makes $7 \times ? = 56$. Divide: $56 \div 7 = 8$.

Check: $7 \times 8 = 56$.

The length is 8 meters.

9**Cut it into two parts**

(a) The left part: $4 \times 6 = 24$. The right part: $3 \times 6 = 18$.

(b) $24 + 18 = 42$. The area is 42 square units.

(c) $7 \times 6 = 42$. The two methods agree.

10**L-shaped patio**

The top rectangle is 3 ft by 4 ft: $3 \times 4 = 12$.

The bottom rectangle is 8 ft by 3 ft: $8 \times 3 = 24$.

Add: $12 + 24 = 36$.

The area of the patio is 36 square feet.

11**Fence around a yard**

The fence goes around the whole yard, so we need the perimeter.

$$P = 12 + 5 + 12 + 5 = 34.$$

He needs 34 feet of fence.

12**Perimeter of a pentagon**

A pentagon has 5 sides. Add them all: $4 + 6 = 10$, $10 + 5 = 15$, $15 + 7 = 22$, $22 + 3 = 25$.

The perimeter is 25 centimeters.

13 The third side



Add the known sides: $9 + 7 = 16$.

Subtract from the perimeter: $24 - 16 = 8$.

The third side is 8 centimeters. Check: $9 + 7 + 8 = 24$.

14 Which rug is larger?



(a) Rug A: $6 \times 4 = 24$ sq ft. Rug B: $5 \times 5 = 25$ sq ft. Rug B covers more floor, by 1 square foot.

(b) Rug A: $2 \times (6 + 4) = 20$ ft. Rug B: $4 \times 5 = 20$ ft.

(c) The perimeters are equal (20 ft), but the areas are different. The same perimeter does not mean the same area.

15 Same area, different shapes



(a) We need pairs with product 24: 1×24 , 2×12 , 3×8 , 4×6 .

(b) Perimeters: $2 \times (24 + 1) = 50$, $2 \times (12 + 2) = 28$, $2 \times (8 + 3) = 22$,
 $2 \times (6 + 4) = 20$.

Length	Width	Area	Perimeter
24	1	24	50
12	2	24	28
8	3	24	22
6	4	24	20

(c) The 6 by 4 mat has the smallest perimeter, 20 inches. It is the closest to a square.

16 Same perimeter, different shapes

(a) Half the perimeter is $20 \div 2 = 10$. So the width is $10 - \text{length}$: 1, 2, 3, 4, and 5 cm.

(b) The areas are $9 \times 1 = 9$, $8 \times 2 = 16$, $7 \times 3 = 21$, $6 \times 4 = 24$, $5 \times 5 = 25$ square centimeters.

Length	Width	Perimeter	Area
9	1	20	9
8	2	20	16
7	3	20	21
6	4	20	24
5	5	20	25

(c) The 5 by 5 square has the greatest area, 25 square centimeters.

17 Width first, then area

Half the perimeter is $26 \div 2 = 13$. One length plus one width is 13, so the width is $13 - 8 = 5$ m. (Check: $8 + 5 + 8 + 5 = 26$.)

Area: $8 \times 5 = 40$.

The width is 5 meters and the area is 40 square meters.

18 From perimeter to area of a square



A square has 4 equal sides, so one side is $36 \div 4 = 9$ cm.

Area: $9 \times 9 = 81$.

The area is 81 square centimeters.

19 Carpet in a room



Floor: $9 \times 7 = 63$ sq ft. Carpet: $5 \times 4 = 20$ sq ft.

Subtract: $63 - 20 = 43$.

43 square feet of floor are not covered.

20 A notched shape



(a) The left side is 8 cm, so the full right side is also 8 cm. The notch takes 3 cm from the top, so the missing side is $8 - 3 = 5$ cm.

(b) $6 + 3 + 4 + 5 + 10 + 8 = 36$. The perimeter is 36 centimeters.

(c) The big rectangle is $10 \times 8 = 80$. The notch is $4 \times 3 = 12$. Then $80 - 12 = 68$.

The area is 68 square centimeters. (Check by splitting: $6 \times 3 + 10 \times 5 = 18 + 50 = 68$.)

21 A banner and the distributive property



$7 \times 12 = 7 \times (10 + 2) = 7 \times 10 + 7 \times 2 = 70 + 14 = 84$.

The area of the banner is 84 square feet.

22 Is Mia right?



(a) The 1 by 12 rectangle: $P = 2 \times (1 + 12) = 26$ in and $A = 1 \times 12 = 12$ sq in. The 4 by 4 square: $P = 4 \times 4 = 16$ in and $A = 4 \times 4 = 16$ sq in.

(b) **Mia is not right.** The rectangle has the longer perimeter (26 in compared to 16 in) but the smaller area (12 sq in compared to 16 sq in). Perimeter and area measure different things.



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