

## Perimeter of Polygons

Perimeter is the total length around a shape — the distance you'd walk to go all the way around. For polygons, just add up the side lengths.

Formula
Perimeter = sum of all side lengths
Rectangle: $P = 2 \times l + 2 \times w$
Square: $P = 4 \times \text{side}$

### Key Concepts

- Perimeter** is the total distance around a closed shape. Add up every side length.
- For a **rectangle**, there are 2 pairs of equal sides, so  $P = 2l + 2w$  (or  $2(l + w)$ ).
- For a **square**, all 4 sides are equal, so  $P = 4 \times \text{side}$ .
- Perimeter is measured in *single* (linear) units — inches, feet, meters — never *square* units. Square units are for area.

### Worked Examples

① A rectangle is 9 in long and 5 in wide. What is its perimeter?

 Use the formula:  $P = 2l + 2w = 2 \times 9 + 2 \times 5 = 18 + 10 = 28$  in.

 **Answer:** 28 in

② A square has sides of 6 cm. What is its perimeter?

 All four sides are 6 cm:  $P = 4 \times 6 = 24$  cm.

 **Answer:** 24 cm

③ A triangle has sides 3 ft, 4 ft, and 5 ft. What is its perimeter?

 Just add:  $3 + 4 + 5 = 12$  ft.

 **Answer:** 12 ft

### Practice Problems

Find the perimeter (or missing side).

1. Rectangle:  $l = 8$ ,  $w = 3 \Rightarrow P = ?$  \_\_\_\_\_

2. Square:  $s = 7 \Rightarrow P = ?$  \_\_\_\_\_

3. Rectangle:  $l = 10$ ,  $w = 4 \Rightarrow P = ?$  \_\_\_\_\_

4. Triangle: sides 5, 6, 7  $\Rightarrow P = ?$  \_\_\_\_\_

5. Square:  $s = 9 \Rightarrow P = ?$  \_\_\_\_\_

6. Rectangle:  $l = 6$ ,  $w = 6 \Rightarrow P = ?$  \_\_\_\_\_

7. Triangle: sides 4, 4, 4  $\Rightarrow P = ?$  \_\_\_\_\_

8. Rectangle:  $l = 12$ ,  $w = 5 \Rightarrow P = ?$   
\_\_\_\_\_

10. Hexagon: all sides = 2  $\Rightarrow P = ?$   
\_\_\_\_\_

9. Pentagon: all sides = 3  $\Rightarrow P = ?$   
\_\_\_\_\_

11.  $P = 32$ ,  $l = 10 \Rightarrow w = ?$  \_\_\_\_\_

12.  $P = 24$ , square  $\Rightarrow s = ?$  \_\_\_\_\_

**Study Tips**

✎ Perimeter is in linear units (inches, feet, meters). Area is in *square* units (sq in, sq ft). Don't mix them up.

✎ For a rectangle, you can use  $P = 2(l + w)$  as a shortcut: add length and width, then double.

✎ For regular polygons (all sides equal), multiply the side length by the number of sides.

**Word Problems**

1. Jake wants to put a fence around his rectangular garden that is 10 ft long and 6 ft wide. How many feet of fencing does he need?

Answer: \_\_\_\_\_

2. A square picture frame has a perimeter of 36 in. What is the length of one side?

Answer: \_\_\_\_\_

**Answer Key — with Friendly Explanations****Practice Problems**

1.  $2 \times 8 + 2 \times 3 = 22$ .

 **Answer:** 22

2.  $4 \times 7 = 28$ .

 **Answer:** 28

3.  $2 \times 10 + 2 \times 4 = 28$ .

 **Answer:** 28

4.  $5 + 6 + 7 = 18$ .

 **Answer:** 18

5.  $4 \times 9 = 36$ .

 **Answer:** 36

6.  $2 \times 6 + 2 \times 6 = 24$ .

 **Answer:** 24

7.  $3 \times 4 = 12$ .

 **Answer:** 12

8.  $2 \times 12 + 2 \times 5 = 34$ .

 **Answer:** 34

9.  $5 \times 3 = 15$ .

 **Answer:** 15

10.  $6 \times 2 = 12$ .

 **Answer:** 12

11.  $P = 2l + 2w$ , so  $32 = 20 + 2w$ ,  $2w = 12$ ,  $w = 6$ .

 **Answer:** 6

12.  $24 \div 4 = 6$ .

 **Answer:** 6**Word Problems**

1.  $2(10) + 2(6) = 32$  ft of fencing.

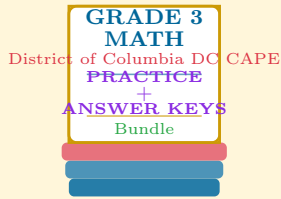
 **Answer:** 32 ft

2.  $36 \div 4 = 9$  in per side.

 **Answer:** 9 in

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