

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.

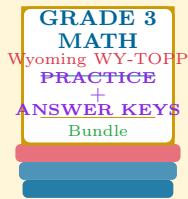
 **Answer:** 32 ft

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

 **Answer:** 9 in

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