SIGMABUDGIE · GRADE 4

Area, Perimeter & Angles

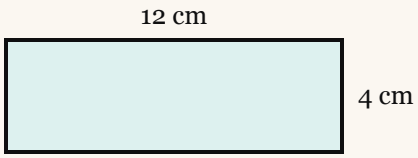
A gentle walkthrough & a 24-question exam

Part 1 walks through area, perimeter, angles, and shapes from the very beginning, with drawings. Part 2 is a 24-question exam that starts easy and slowly builds to harder, ISEE-style reasoning questions. Work through the lesson together first, then let your child try the exam. The answer key at the back explains every question.

1 · The two formulas

Perimeter is the distance around: add all four sides, or **2 × (length + width)**. **Area** is the space inside: **length × width**.

A 12 cm by 4 cm rectangle: perimeter 2 × (12 + 4) = **32 cm**. Area 12 × 4 = **48 square cm**.

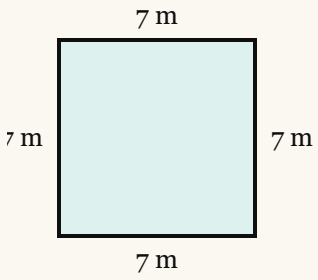


P = 32 cm, A = 48 sq cm

2 · Squares: one number tells all

A square has 4 equal sides. Side 7: perimeter 4 × 7 = **28**, area 7 × 7 = **49**.

Backwards: if the **area is 49**, the side is 7 (because 7 × 7 = 49), so the perimeter is **28**. If the **perimeter is 36**, the side is 36 ÷ 4 = 9, so the area is **81**.

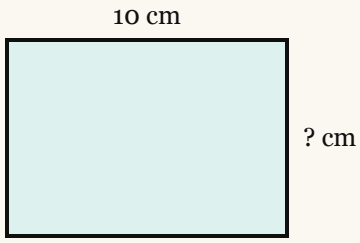


side 7: P = 28, A = 49

3 · Perimeter to a missing side

A rectangle has perimeter **34 cm** and length **10 cm**. Two lengths use 20 cm. The rest, 34 − 20 = 14, is two widths, so the width is **7 cm**.

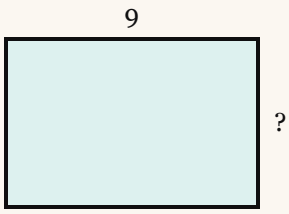
Now the area: 10 × 7 = **70 square cm**. Perimeter → missing side → area is a favorite test chain.



P = 34, length 10, so width 7 and A = 70

4 · Area to a missing side

Area **54**, length **9**: 9 × ? = 54, so the width is 54 ÷ 9 = **6**. Perimeter: 2 × (9 + 6) = **30**.



A = 54, length 9, so width 6 and P = 30

5 · Area minus perimeter

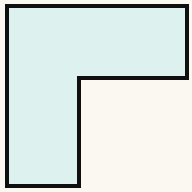
Tests love this: "A rectangle is 12 cm long and 4 cm wide. What is the **difference** between its area and its perimeter?" Area 48, perimeter 32, difference 48 − 32 = **16**.

Work out both numbers first, then subtract. Do not mix the two up.

6 · Odd shapes

Cut an L shape into two rectangles, find each area, and add. For the perimeter, walk every edge: opposite sides across a notch still add up to the full width and height.

An L that fits in a 9 by 9 square has the **same perimeter** as that square (36), but less area.



cut into rectangles for area; walk the edges for perimeter

7 · Triangles and other polygons

Perimeter works for any shape: add every side. A triangle with sides 16, 13, and 10 has perimeter **39 cm**.

A regular polygon has equal sides, so multiply: a regular hexagon with side 8 has perimeter 6 × 8 = **48**.

triangle: add the three sides regular hexagon: 6 × side

8 · Angles: right, acute, obtuse, straight

A **right angle** is a square corner, 90°. **Acute** is less than 90°. **Obtuse** is more than 90° but less than a straight line. A **straight angle** is 180°, a straight line.

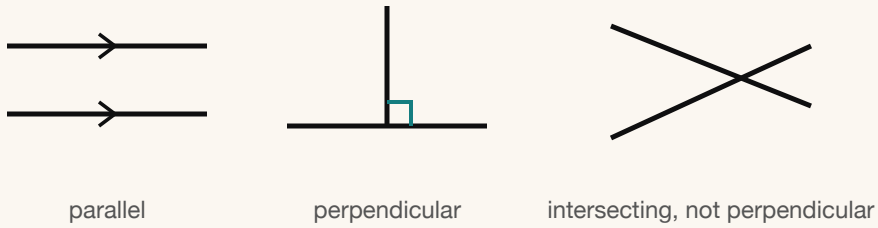
A full turn is 360°. A half turn is 180°. A quarter turn is one right angle, 90°.

acute right, 90° obtuse straight, 180°

9 · Parallel and perpendicular

Parallel lines run side by side and never meet, like train tracks. **Perpendicular** lines cross at a right angle, like a plus sign.

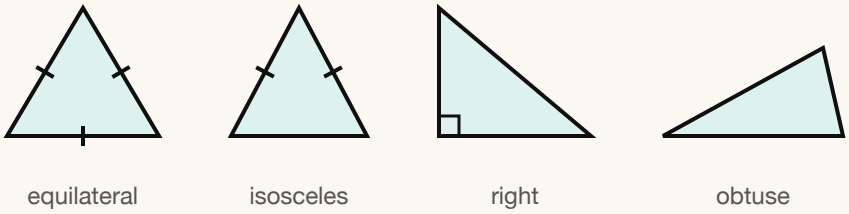
Lines that cross at any other angle are just intersecting.



10 · Naming triangles

By sides: **equilateral** (3 equal), **isosceles** (2 equal), **scalene** (none). By angles: **right** (one 90°), **acute** (all under 90°), **obtuse** (one over 90°).

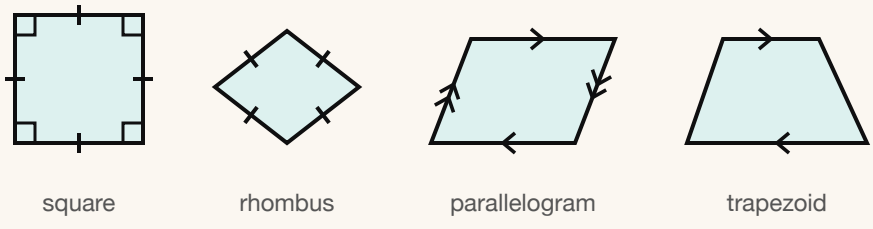
A triangle can have two names: a right isosceles triangle has a square corner and two equal sides.



11 · Naming quadrilaterals

Square: 4 equal sides, 4 right angles. **Rectangle:** 4 right angles. **Rhombus:** 4 equal sides.
Parallelogram: 2 pairs of parallel sides. **Trapezoid:** exactly 1 pair.

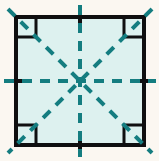
Every square is also a rectangle, a rhombus, and a parallelogram. Rules stack.



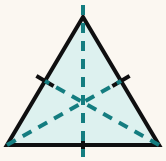
12 · Symmetry

A **line of symmetry** folds a shape onto itself. A square has 4, a rectangle has 2, an equilateral triangle has 3, a circle has endless lines.

A parallelogram that is not a rectangle or rhombus has **none**, even though it looks balanced. You are ready for the test! 🎉



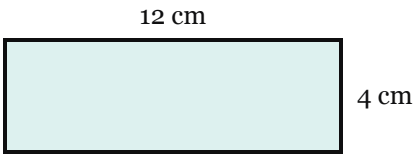
square: 4 lines



equilateral: 3 lines

Read each drawing first, then choose the best answer. Take your time, there is no clock here. Questions start gentle and get harder toward the end. Circle your answer.

1 A rectangle is 12 cm long and 4 cm wide. What is its perimeter?



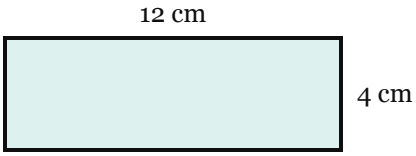
A 48 cm

B 32 cm

C 16 cm

D 24 cm

2 What is the area of the same rectangle?



A 32 square cm

B 16 square cm

C 24 square cm

D 48 square cm

3 A triangle has sides 16 cm, 13 cm, and 10 cm. What is its perimeter?

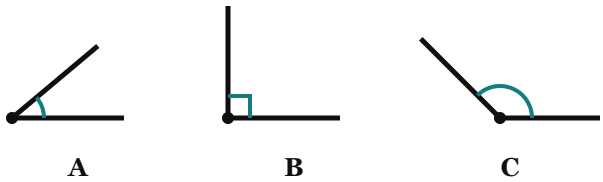
A 39 cm

B 29 cm

C 26 cm

D 49 cm

4 Which angle is obtuse?



A A

B B

C C

D None of them

5 A square has sides of 7 m. What is its area?

A 28 square m

B 14 square m

C 21 square m

D 49 square m

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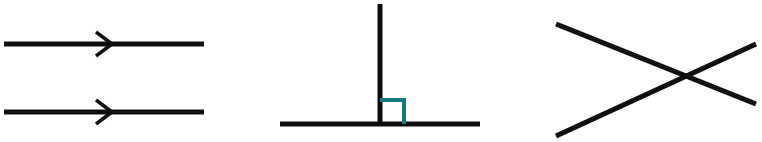
6 Which pair of lines is perpendicular?



A **B** **C**

A A

B B

C C

D A and C

---

7 A square has an area of 49 square m. What is its perimeter?

A 49 m

B 14 m

C 28 m

D 196 m

---

8 How many degrees are in a right angle?

A 90°

B 180°

C 45°

D 360°

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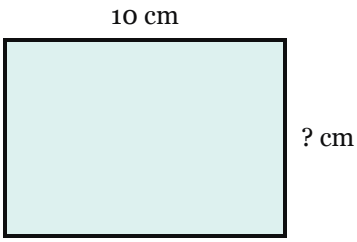
9 A rectangle has a perimeter of 34 cm and a length of 10 cm. What is its width?



A 24 cm

B 7 cm

C 12 cm

D 17 cm

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10 A rectangle is 12 cm long and 4 cm wide. What is the difference between its area and its perimeter?

A 48
B 32
C 8
D 16

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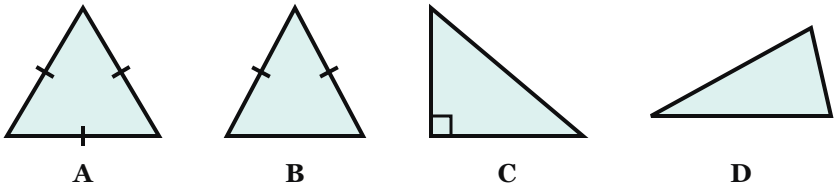
11 Which triangle is isosceles?



A **B** **C** **D**

A B
B A
C C
D D

---

12 A square has a perimeter of 36 cm. What is its area?

A 36 square cm
B 9 square cm
C 81 square cm
D 144 square cm

---

13 Which shape has exactly one pair of parallel sides?

A parallelogram
B rectangle
C rhombus
D trapezoid

---

14 How many lines of symmetry does a rectangle (that is not a square) have?

A 4
B 2
C 1
D 0

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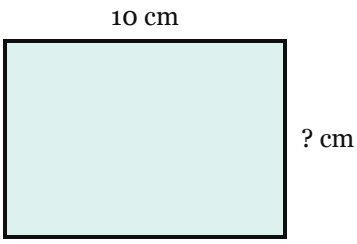
15 A rectangle has a perimeter of 34 cm and a length of 10 cm. What is its area?



A 340 square cm

B 34 square cm

C 70 square cm

D 240 square cm

---

16 A square has an area of 121 square m. What is its perimeter?

A 44 m

B 121 m

C 22 m

D 484 m

---

17 A rectangle has an area of 54 square cm and a length of 9 cm. What is its perimeter?

A 30 cm

B 63 cm

C 24 cm

D 15 cm

---

18 How many degrees is a half turn?

A 90°

B 360°

C 180°

D 45°

---

19 A regular hexagon has a perimeter of 48 cm. How long is each side?

A 6 cm

B 12 cm

C 42 cm

D 8 cm

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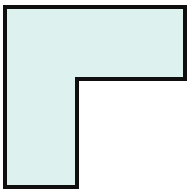
20 This L shape fits inside a 9 by 9 square, with a 6 by 6 corner cut away. What is its area?



A 81 square units

B 45 square units

C 36 square units

D 54 square units

---

21 Which statement is true?

A Every rhombus is a square.

B Every rectangle is a square.

C Every square is a rhombus.

D Every trapezoid is a parallelogram.

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22 Two rectangles have the same perimeter of 20 cm. One is 8 by 2, the other is 6 by 4. How much bigger is the larger area?

A 8 square cm

B 4 square cm

C 16 square cm

D 24 square cm

---

23 A triangle has one angle of 90° and two equal sides. What is it called?

A an equilateral triangle

B a right isosceles triangle

C an obtuse scalene triangle

D an acute triangle

---

24 A rectangle is twice as long as it is wide. Its perimeter is 30 cm. What is its area?

A 30 square cm

B 60 square cm

C 25 square cm

D 50 square cm

ANSWER KEY & EXPLANATIONS

1	**B**	2 × (12 + 4) = 32 cm.
2	**D**	12 × 4 = 48 square cm.
3	**A**	16 + 13 + 10 = 39.
4	**C**	C opens wider than a right angle.
5	**D**	7 × 7 = 49.
6	**B**	B crosses at a right angle.
7	**C**	7 × 7 = 49, so each side is 7. 4 × 7 = 28.
8	**A**	A right angle is a quarter turn, 90°.
9	**B**	Two lengths are 20. 34 − 20 = 14 is two widths, so 7.
10	**D**	Area 48, perimeter 32. 48 − 32 = 16.
11	**A**	B has exactly two equal sides (the tick marks).
12	**C**	36 ÷ 4 = 9 per side. 9 × 9 = 81.
13	**D**	The other three have two pairs.
14	**B**	One through the middle each way. The diagonals do not work.
15	**C**	Width = (34 − 20) ÷ 2 = 7. Area 10 × 7 = 70.
16	**A**	11 × 11 = 121. 4 × 11 = 44.
17	**A**	Width 54 ÷ 9 = 6. Perimeter 2 × (9 + 6) = 30.
18	**C**	A full turn is 360°, so half is 180°.
19	**D**	Six equal sides: 48 ÷ 6 = 8.
20	**B**	9 × 9 = 81, minus the 6 × 6 = 36 corner: 45.
21	**C**	A square has 4 equal sides, so it fits the rhombus rule. The reverse needs right angles.
22	**A**	8 × 2 = 16 and 6 × 4 = 24. 24 − 16 = 8.
23	**B**	One right angle makes it right; two equal sides make it isosceles.
24	**D**	Width w, length 2w: 2 × (w + 2w) = 6w = 30, so w = 5 and length 10. Area 5 × 10 = 50.