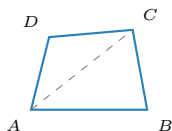


Quadrilaterals

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What is a Quadrilateral?

A closed, flat shape with **4 straight sides**, 4 vertices, and 4 interior angles.



Angle Sum

$$\angle A + \angle B + \angle C + \angle D = 360^\circ$$

Why? One diagonal $\rightarrow$ two triangles.

$$2 \times 180^\circ = 360^\circ$$

Example: Angles 78° , 116° , 63° , x :
 $x = 360^\circ - 257^\circ = 103^\circ$

The Six Special Quadrilaterals

Square



All sides equal, all 90°
 Diags equal, bisect at 90°
 4 sym. lines $\cdot$ rot. order 4

Rectangle



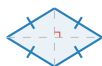
Opp. sides equal, all 90°
 Diags equal, bisect (not 90°)
 2 sym. lines $\cdot$ rot. order 2

Parallelogram



Opp. sides equal & parallel
 Diags bisect (not equal)
 0 sym. lines $\cdot$ rot. order 2

Rhombus



All sides equal, opp. $\angle$ s equal
 Diags bisect at 90°
 2 sym. lines $\cdot$ rot. order 2

Trapezium



Exactly 1 pair parallel sides
 Co-interior $\angle$ s $\rightarrow 180^\circ$
 0 sym. lines $\cdot$ rot. order 1

Kite



2 pairs adjacent sides equal
 Axis diag bisects other at 90°
 1 sym. line $\cdot$ rot. order 1

Properties at a Glance

Property	Square	Rect.	Paral.	Rhombus	Trap.	Kite
All sides equal	✓	×	×	✓	×	×
Opp. sides parallel	✓	✓	✓	✓	1 pair	×
All angles 90°	✓	✓	×	×	×	×
Opp. angles equal	✓	✓	✓	✓	×	1 pair
Diags equal length	✓	✓	×	×	×	×
Diags halve each other	✓	✓	✓	✓	×	×
Diags meet at 90°	✓	×	×	✓	×	✓
Lines of symmetry	4	2	0	2	0 or 1	1
Rot. symmetry order	4	2	2	2	1	1

Common Traps

- Every square **is** a rectangle, rhombus, and parallelogram — not the reverse.
- A parallelogram has **no** lines of symmetry — don't confuse it with a rectangle.
- In a kite only **one** pair of opposite $\angle$ s is equal, not both pairs.

Quick Exam Tips

Isosceles trapezium: 1 symmetry line, equal diags, equal base $\angle$ s.

Co-interior $\angle$ s: Same-side angles between parallel lines total 180° .

Hierarchy: Square $\subset$ Rect. $\subset$ Paral. $\subset$ Quadrilateral.