Class 8 | Maths | Ch 4: Quadrilaterals | MEDIUM

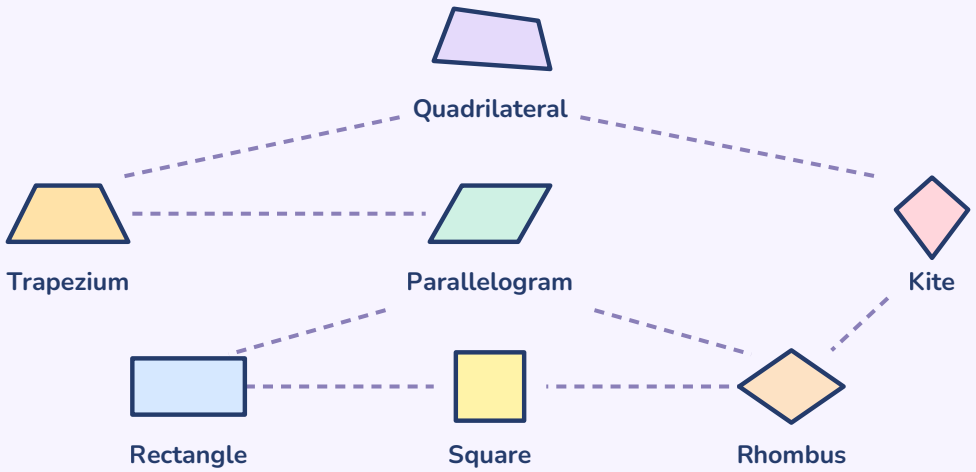
Name: _____ Date: _____

MEDIUM — Time to Apply!

Apply the properties to find unknown angles and lengths and to classify shapes.

Brainy says: Hello, shape detective! I am Brainy, and today we study four-sided shapes: rectangles, parallelograms, rhombuses, kites and trapeziums. They look different, but they are all members of one big family and share many hidden properties. We will find what makes each one special, and learn to reason like a mathematician!

The quadrilateral family: lower shapes are special cases of the shapes above them



Total of all four angles in any quadrilateral = 360°

A family tree of quadrilaterals: each lower shape is a special case of the shape(s) above it.

SECTION A — PARALLELOGRAMS AND RECTANGLES

Q1. In parallelogram ABCD, ∠A = 65°. What are ∠B and ∠C?

(a) ∠B = 65°, ∠C = 115°
(b) ∠B = 115°, ∠C = 115°
(c) ∠B = 115°, ∠C = 65°
(d) ∠B = 65°, ∠C = 65°

Q2. If the two diagonals of a quadrilateral are equal in length and also bisect each other, the quadrilateral must be a rectangle.

☐ True ☐ False

Q3. A rectangular farm plot in Punjab has one diagonal measuring 60 m. What is the length of the other diagonal?

(a) 30 m
(b) 60 m
(c) 90 m
(d) 120 m

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Q4. A sign-board maker in Gujarat cuts a parallelogram-shaped board PQRS with ∠P = 112°. What is ∠Q?

(a) 112°
(c) 56°
(b) 90°
(d) 68°

Q5. In parallelogram ABCD, ∠A : ∠B = 2 : 3. Find all four angles.

Q6. Match each shape with an extra property it has that a general parallelogram does not.

Column A	Column B
1. Rectangle	A. all sides are equal
2. Rhombus	B. diagonals bisect each other only
3. Square	C. all angles are 90°
4. Parallelogram	D. equal sides and equal diagonals

SECTION B — RHOMBUSES

Q7. The diagonals of a rhombus are always equal in length.

☐ True
☐ False

Q8. A rangoli design uses a rhombus-shaped tile with one angle equal to 72°. What is the adjacent angle of this tile?

(a) 108°
(c) 90°
(b) 72°
(d) 36°

Q9. In rhombus ABCD, the diagonals meet at O and ∠AOB = 90°. If ∠OAB = 35°, what is ∠OBA?

(a) 55°
(c) 45°
(b) 35°
(d) 65°

Q10. A tailor cuts a cloth piece that is a rhombus with one right angle. What shape must it be?

(a) A kite that is not a rhombus
(c) A square
(b) A general rectangle, not a square
(d) A general parallelogram only

Q11. The diagonals of a rhombus are 16 cm and 12 cm. Find the length of its side and its perimeter.

SECTION C — KITES AND TRAPEZIUMS

Q12. A paper kite sold at a mela is shaped like quadrilateral ABCD with AB = BC and CD = DA. Diagonal BD bisects ∠ABC. If ∠ABC = 80°, what is ∠ABD?

(a) 80°
(b) 20°
(c) 40°
(d) 160°

Q13. Three of these are genuine properties of an isosceles trapezium (with equal legs). Which one is NOT?

(a) The base angles on each parallel side are equal
(b) The legs (non-parallel sides) are equal
(c) Angles on the same leg are supplementary
(d) Both pairs of opposite sides are parallel

Q14. In trapezium PQRS with PQ ∥ SR, match each angle fact with its value.

Column A	Column B
1. ∠P = 70°	A. ∠S = 110°
2. ∠Q = 85°	B. ∠P = 60°
3. ∠S = 120°	C. ∠Q = 80°
4. ∠R = 100°	D. ∠R = 95°

Q15. By the chapter's definition of a trapezium (at least one pair of parallel opposite sides), every parallelogram also counts as a trapezium.

☐ True
☐ False

SECTION D — CLASSIFYING AND REASONING

Q16. A student says: 'Since every rhombus is a kite, every kite must also be a rhombus.' Is this reasoning correct?

(a) Yes: kites and rhombuses are exactly the same shapes
(b) No: a kite only needs two pairs of equal adjacent sides
(c) No: rhombuses are not actually kites at all
(d) Yes: because both always have perpendicular diagonals

Q17. Three of these facts about a quadrilateral guarantee it is a rectangle. Which one does NOT guarantee this by itself?

(a) All four of its angles are 90°
(b) Its diagonals are equal and bisect each other
(c) Opposite sides are equal and parallel, and one angle is 90°
(d) Its diagonals bisect each other (nothing more is known)

Q18. The angles of a quadrilateral are in the ratio 1 : 2 : 3 : 4. Find each angle.

Q19. Explain why a square is both a rectangle and a rhombus.

Q20. Explain, using a diagonal, why the angles of a quadrilateral add up to 360°.

Brainy Bonus — Did You Know?

A parallelogram is not a rigid shape. If you push on a rectangular frame made of four sticks hinged at the corners, it leans into a parallelogram. That is why gates and shelves are often given a diagonal support, which makes two rigid triangles.

Try it: make a rectangle with four strips of cardboard and pins, and see how it changes when you push the corner.

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