CLASS 8 · MATHEMATICS

Quadrilaterals

Sample paper · 15 questions · 22 marks

10 objective questions × 1 mark. Five written-response questions: 12 marks. Write your working where needed. Suggested time: 45 minutes. Answers and marking guidance follow the questions.

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Section A · Objective questions (10 marks)

1. The sum of the four interior angles of any quadrilateral is:

A. 270 degrees

B. 540 degrees

C. 180 degrees

D. 360 degrees

2. In a parallelogram, opposite sides are always:

A. Perpendicular

B. Equal but not parallel

C. Equal and parallel

D. Parallel but not equal

3. Which statement about the diagonals of a rectangle is true?

A. They never bisect each other

B. They are equal and bisect each other

C. They are always perpendicular

D. They are always unequal

4. The diagonals of a rhombus:

A. Are parallel to each other

B. Never intersect

C. Are always equal in length

D. Bisect each other at right angles

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5. A parallelogram with all four sides equal is called a:

A. Pentagon

B. Rhombus

C. Trapezium

D. Rectangle

6. Three angles of a quadrilateral are 70 degrees, 80 degrees and 100 degrees. The fourth angle is:

A. 110 degrees

B. 120 degrees

C. 105 degrees

D. 100 degrees

7. A quadrilateral has two parallel sides. The two interior angles on the same non-parallel side add up to:

A. 270 degrees

B. 90 degrees

C. 180 degrees

D. 360 degrees

8. Each interior angle of a rectangle measures:

A. 120 degrees

B. 60 degrees

C. 90 degrees

D. It varies from rectangle to rectangle

9. A kite is a quadrilateral with:

A. Two pairs of equal adjacent sides

B. Opposite sides equal

C. Diagonals always equal

D. All angles equal

10. The diagonals of a square are:

A. Equal and perpendicular

B. Equal but not perpendicular

C. Neither equal nor perpendicular

D. Perpendicular but unequal

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Section B · Written responses (12 marks)

Attempt all five. Use a separate sheet if you need more space. The marks for each question are shown.

11. One angle of a parallelogram is 70 degrees. Find the other three angles, giving reasons. [2 marks]

12. Explain why the two diagonals of a square divide it into four congruent triangles. [2 marks]

13. Name one property that a rectangle and a rhombus share, and one property on which they differ. [2 marks]

14. The four angles of a quadrilateral are in the ratio 1 : 2 : 3 : 4. Find all four angles. [3 marks]

15. The diagonals of a rhombus are 10 cm and 24 cm. Find the length of its side, explaining each step. [3 marks]

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Answers & marking guidance

Use these after attempting the paper. Accept equivalent correct reasoning and sensible units. These are Evater model answers, not an official marking scheme.

Section A · 1 mark each

1. D — A diagonal splits a quadrilateral into two triangles, and 2 x 180 degrees = 360 degrees.

2. C — By definition both pairs of opposite sides of a parallelogram are parallel, and they are also equal in length.

3. B — A rectangle's diagonals are equal in length and cut each other in half; they are not perpendicular unless it is a square.

4. D — A rhombus's diagonals bisect each other at 90 degrees; they are equal only when the rhombus is a square.

5. B — A rhombus is a parallelogram whose four sides are all equal.

6. A — 360 - (70 + 80 + 100) = 360 - 250 = 110 degrees.

7. C — The non-parallel side is a transversal of the parallel sides, so the co-interior angles are supplementary: they add to 180 degrees.

8. C — All four angles of a rectangle are right angles, 90 degrees each.

9. A — A kite has two distinct pairs of equal-length sides that are adjacent to each other.

10. A — A square is both a rectangle and a rhombus, so its diagonals are equal in length and cut each other at right angles.

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Section B · Model answers

11. Adjacent angles of a parallelogram add up to 180 degrees, so the angle next to the 70 degree angle is 110 degrees. Opposite angles are equal, so the four angles are 70, 110, 70 and 110 degrees.

Marking: 1 mark for using adjacent supplementary angles to get 110 degrees; 1 mark for all four angles with opposite angles equal.

12. The diagonals of a square are equal, bisect each other and meet at right angles. Each of the four triangles formed has two sides equal to half a diagonal and the included angle 90 degrees, so by the SAS condition all four triangles are congruent.

Marking: 1 mark for the diagonal properties of a square; 1 mark for a valid congruence argument (SAS or equivalent).

13. Shared: both are parallelograms, so opposite sides are equal and parallel (or: their diagonals bisect each other). Different: every angle of a rectangle is 90 degrees, while a rhombus need not have right angles; and all sides of a rhombus are equal, while a rectangle need not have all sides equal.

Marking: 1 mark for any correct shared property; 1 mark for any correct difference.

14. Let the angles be x, 2 x, 3 x and 4 x. Their sum is 10 x = 360 degrees, so x = 36 degrees. The angles are 36, 72, 108 and 144 degrees.

Marking: 1 mark for setting the angles as multiples of x; 1 mark for using the 360 degree sum to get x = 36; 1 mark for all four angles.

15. The diagonals of a rhombus bisect each other at right angles, so each side is the hypotenuse of a right triangle with legs 5 cm and 12 cm. Side = square root of (5 squared + 12 squared) = square root of (25 + 144) = square root of 169 = 13 cm.

Marking: 1 mark for halving the diagonals using perpendicular bisection; 1 mark for applying the Pythagoras theorem; 1 mark for the side 13 cm.

Topic references

NCERT Class 8 Mathematics, Ganita Prakash, Chapter 4: Quadrilaterals.

https://ncert.nic.in/textbook/pdf/hegp104.pdf

Concept reference only. Questions and model answers are original Evater practice material, not an official NCERT paper.

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