

Board – CBSE

Class – 8th

Topic – Understanding Quadrilateral 3.4

Q.1 State whether the following statements are True or False.

- (a) All rectangles are squares.
- (b) All rhombuses are parallelograms.
- (e) All squares are rhombuses and also rectangles.
- (d) All squares are not parallelograms.
- (e) All kites are rhombuses.
- (f) All rhombuses are kites.
- (g) All parallelograms are trapeziums.
- (h) All squares are trapeziums.

Sol: (a) False. All rectangles are squares.

Since squares have all sides equal.

(b) True. All rhombuses are parallelograms.

Since, in rhombus, opposite angles are equal and diagonals intersect at midpoints.

(c) True. All squares are rhombus and also rectangles.

Since, squares have the same property as a rhombus, but not a rectangle.

(d) False. All squares are not parallelograms.

Since all squares have the same property of parallelograms.

(e) False. All kites are not rhombuses.

Since all kites do not have equal sides.

(f) Yes, all rhombus are kites, since they have equal sides and diagonals bisect each other.

(g) True. All parallelograms are trapezium because trapezium has only two parallel sides.

(h) True. All squares are trapeziums. Since squares also have two parallel sides.

Q.2 Identify all the quadrilaterals that have.

- (a) Four sides of equal length.

(b) Four right angles.

Sol: (a) Rhombus and square have sides of equal length.

(b) Square and rectangle have four right angles.

Q.3 Explain how a square is

(i) a quadrilateral.

(ii) a parallelogram.

(iii) a rhombus.

(iv) a rectangle.

Sol: (i) A square is a quadrilateral because it has four sides.

(ii) A square is a parallelogram since its opposite sides are parallel and opposite angles are equal.

(iii) A square is already a rhombus since it has four equal sides and diagonals bisect at right angles.

(iv) A square is a parallelogram since every adjacent angle is a right angle, and opposite sides are equal.

Q.4 Name the quadrilaterals whose diagonals

(i) Bisect each other.

(ii) Are perpendicular bisectors of each other.

(iii) Are equal.

Sol: (i) If diagonals of a quadrilateral bisect each other then it is a rhombus, parallelogram, rectangle, or square.

(ii) If diagonals of a quadrilateral are perpendicular bisectors of each other, then it is a rhombus or square.

(iii) If diagonals are equal, then it is a square or rectangle.

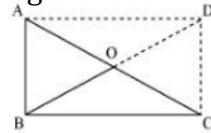
Q.5 Explain why a rectangle is a convex quadrilateral.

Sol: Rectangle is a convex quadrilateral since its vertices are raised and both of its diagonals lie in its interior.

Q.6 ABC is a right-angled triangle and O is the midpoint of the side opposite to the right angle. Explain why O is equidistant from A, B and C. (The dotted lines are drawn additionally to help you.)

Sol: Since, two right triangles make a rectangle where O is an equidistant point from A, B, C, and D, and also O is the midpoint of the two diagonals of a rectangle.

$$AD = BC \text{ and } AB = DC$$



ABCD is a rectangle as opposite sides are equal and parallel to each other and all the interior angles are 90° .

In a rectangle, diagonals are of equal length and also bisect each other.

$$\text{Hence, } AO = OC = BO = OD$$

Thus, O is equidistant from A, B and C.