Examination
Class IX
(Mathematics)

Time:1 Hours **Max. Marks**: 50

I. Answer all the Questions:

1. Show that the diagonals of a square are equal and bisect each other at right angles. Is the converse true?

2. Show that the bisectors of angles of a parallelogram form a rectangle.

3. State Mid Point Theorem and its converse.

4. The angles of the quadrilateral are in the ratio 3: 5: 9: 13. Find all the angles of the quadrilateral.

5. Two parallel lines l and m are intersected by a transversal p (see Fig. 1). Show that the quadrilateral formed by the bisectors of interior angles is a rectangle.

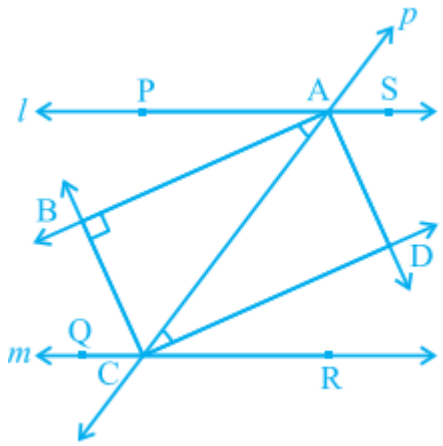

Fig 1

6. State True or False & Justify:

   - If the diagonals of a parallelogram is equal, then it is a rectangle..
   - There exists a square, whose diagonals are not equal.
   - A kite cannot have one pair of opposite sides parallel.
   - There exists a trapezium which is a kite.
   - There cannot be a quadrilateral with 3 points collinear.

7. In Δ ABC and Δ DEF, AB = DE, AB || DE, BC = EF and BC || EF. Vertices A, B and C are joined to vertices D, E and F, respectively (see Fig.2).
   Show that
   (i) quadrilateral ABED is a parallelogram
   (ii) quadrilateral BEFC is a parallelogram
   (iii) AD || CF and AD = CF
   (iv) quadrilateral ACFD is a parallelogram
   (v) AC = DF
   (vi) Δ ABC $\cong$ Δ DEF

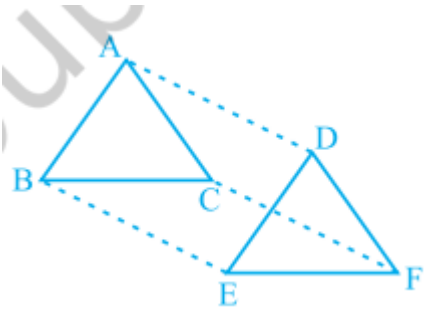

Fig. 2

8. ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD (see Fig. 3).
   Show that
   (i) Δ APB $\cong$ Δ CQD
   (ii) AP = CQ

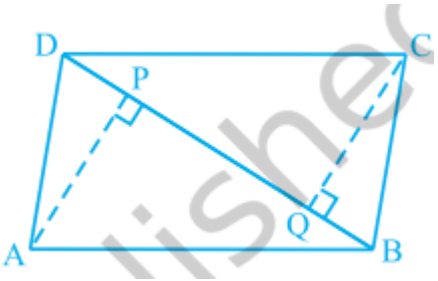

Fig. 3

9. ABCD is a parallelogram in which P and Q are mid-points of opposite sides AB and CD (see Fig. 4). If AQ intersects DP at S and BQ intersects CP at R, show that:
(i) APCQ is a parallelogram.
(ii) DPBQ is a parallelogram.
(iii) PSQR is a parallelogram.

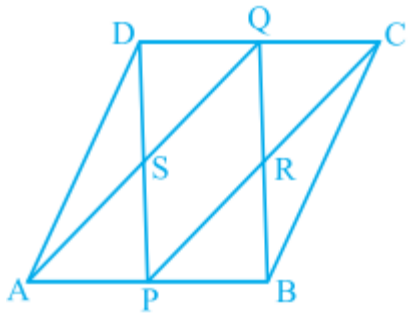

Fig.4

Q10. ABCD is a rhombus. Show that diagonal AC bisects ∠ A as well as ∠ C and diagonal BD bisects ∠ B as well as ∠ D.

All the Best!!