CHAPTER-08 QUADRILATERALS

SUBJECT: MATHEMATICS   **MAX. MARKS : 40**

CLASS : IX   **DURATION : 1½ hrs**

General Instructions:
(i).   **All** questions are compulsory.
(ii). This question paper contains 2**0** questions divided into five Sections A, B, C, D and E.
(iii). **Section A** comprises of **10 MCQs** of **1 mark** each. **Section B** comprises of 4 questions of **2 marks** each. **Section C** comprises of 3 questions of **3 marks** each. **Section D** comprises of 1 question of **5 marks** each and **Section E** comprises of 2 Case Study Based Questions of **4 marks** each.
(iv). There is no overall choice.
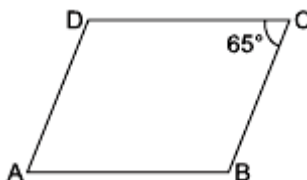(v).   Use of Calculators is not permitted

SECTION – A
Questions 1 to 10 carry 1 mark each.

1. A diagonal of a rectangle is inclined to one side of the rectangle at 25°. The acute angle between the diagonals is
   (a) 55°   (b) 50°   (c) 40°   (d) 25°

2. In the given figure, ABCD is a parallelogram. If ∠C = 65°, then (∠B + ∠D) is equal to

   (a) 180°   (b) 115°   (c) 155°   (d) 230°

3. Given a quadrilateral ABCD, and diagonals AC and BD bisect each other at P such that AP = CP and BP = DP. Also ∠APD = 90°, then quadrilateral is a
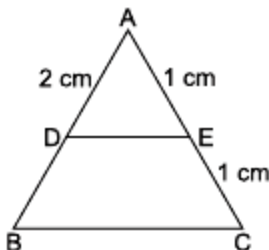   (a) rhombus   (b) trapezium   (c) parallelogram   (d) rectangle

4. Diagonals of a rectangle ABCD intersect at O. If ∠AOB = 70°, then ∠DCO is
   (a) 70°   (b) 110°   (c) 35°   (d) 55°

5. Given a trapezium ABCD, in which AB || CD and AD = BC. If ∠D = 70°, then ∠C will be
   (a) 70°   (b) 110°   (c) 20°   (d) none of these

6. In the given figure, find BD, if DE || BC.

   (a) 2 cm   (b) 1 cm   (c) 3 cm   (d) none of these

7. Four points A,B,C,D are joined together in order and we noticed AB = CD = 5 cm and also, AB is parallel to CD then the quadrilateral obtained is a
   (a) rhombus   (b) trapezium (c) parallelogram   (d) rectangle

8. Two angles of a quadrilateral are 60° and 70° and other two angles are in the ratio 8 : 15, then the remaining two angles are

(a) 140°, 90°　　　　(b) 100°, 130°　　　　(c) 80°, 150°　　　　(d) 70°, 160°

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

9. Assertion (A): If the diagonal of a parallelogram are equal, then it is a rectangle.
Reason (R): The diogonals of parallelogrom bisect each other at right angles.

10. Assertion (A): The quadrilateral formed by joining the midpoints of consecutive sides of a quadrilateral whose diagonals are perpendicular is a rectangle.
Reason (R): The line segment in a triangle joining the midpoint of any two sides of the triangle is said to be parallel to its third side and is also half of the length of the third side and the quadrilateral formed by joining the midpoints of consecutive sides of a quadrilateral is a parallelogram.

SECTION – B
Questions 11 to 14 carry 2 marks each.

11. Prove that a diagonal of a parallelogram divides it into two congruent triangles.

12. Show that the diagonals of a rhombus are perpendicular to each other.

13. ABCD is a parallelogram and AP and CQ are perpendiculars from vertices A and C on diagonal BD (see the below). Show that
(i) $\triangle$ APB $\cong$ $\triangle$ CQD (ii) AP = CQ
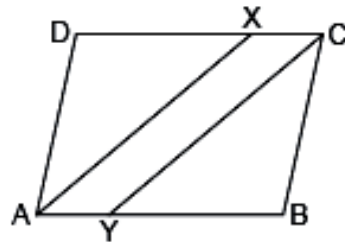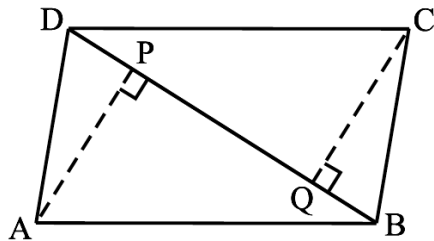
14. In the given above right sided figure, ABCD is a parallelogram and line segments AX and CY bisect the angles A and C respectively. Show that AX || CY.

SECTION – C
Questions 15 to 17 carry 3 marks each.

15. Two parallel lines l and m are intersected by a transversal p. Show that the quadrilateral formed by the bisectors of interior angles is a rectangle.

16. Show that the line segments joining the mid-points of the opposite sides of a quadrilateral bisect each other.

17. In the below left sided figure, ABCD is a parallelogram. E and F are the mid-points of sides AB and CD respectively. Show that the line segments AF and EC trisect the diagonal BD.
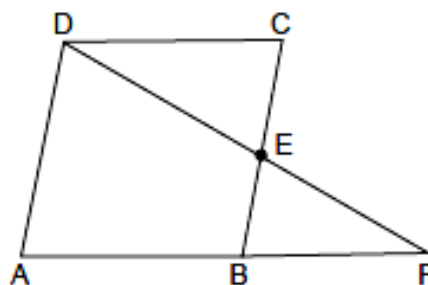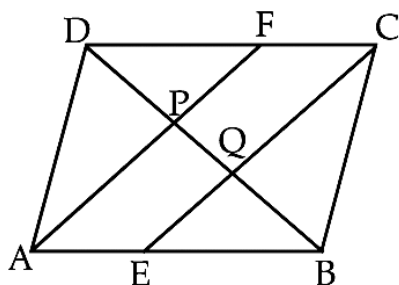
OR

In the above right sided figure, ABCD is a parallelogram and E is the mid-point of side BC. DE and AB on producing meet at F. Prove that AF = 2AB.
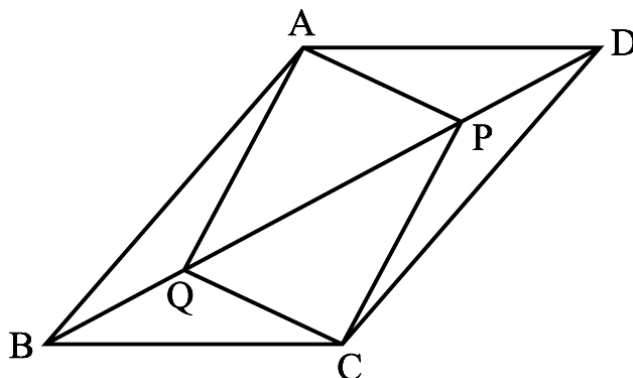
SECTION – D
Questions 18 carry 5 marks.

18. ABCD is a rectangle in which diagonal AC bisects ∠ A as well as ∠ C. Show that: (i) ABCD is a square (ii) diagonal BD bisects ∠ B as well as ∠ D.

OR

In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ (see Figure). Show that :

(a) ΔAPD ≅ ΔCQB
(b) AP = CQ
(c) ΔAQB ≅ ΔCPD
(d) AQ = CP
(e) APCQ is a parallelogram

SECTION – E (Case Study Based Questions)
Questions 19 to 20 carry 4 marks each.

19. In the middle of the city, there was a park ABCD in the form of a parallelogram form so that AB = CD, AB∥CD and AD =BC, AD ∥ BC. Municipality converted this park into a rectangular form by adding land in the form of ΔAPD and ΔBCQ. Both the triangular shape of land were covered by planting flower plants.
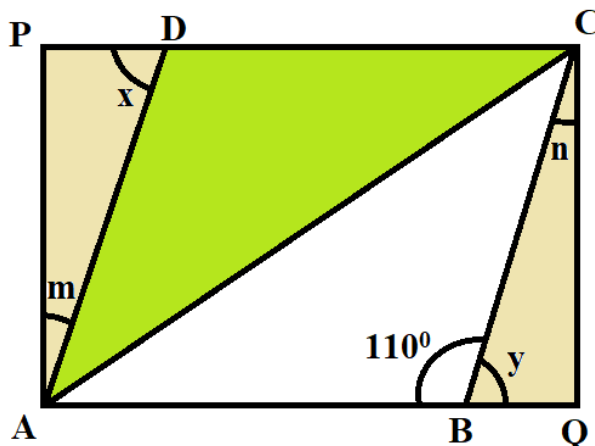
(a) Show that ΔAPD and ΔBQC are congruent. (2)

OR

What is the value of ∠m? (2)
(b) Which side is equal to PD? (1)
(c) Show that ΔABC and ΔCDA are congruent. (1)

20. **Activity-based learning-** ensures active engagement of learner with concepts and instructional materials. Learning is hands-on and experiential, providing learners the opportunity of learning through manipulation of materials and objects.

Teachers model the process, and students work independently to copy it. Kumar sir Maths teacher of class 9th wants to explain the properties of parallelograms in a creative way, so he gave students yellow colored paper in the shape of a quadrilateral and then ask the students to make a parallelogram from it by using paper folding and coloured it with green colour.
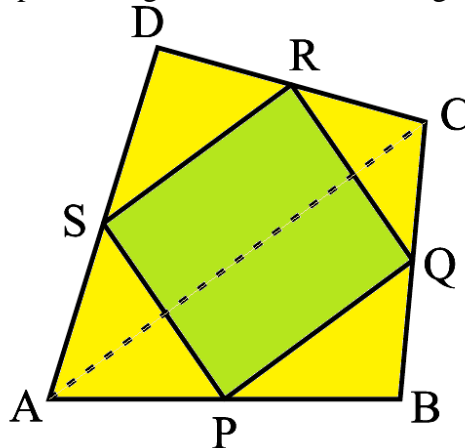
(a) How can a parallelogram be formed by using paper folding? (2)
(b) (i) If ∠RSP = 30°, then find ∠RQP. (1)
(ii) If SP = 3 cm, Find the RQ. (1)

OR

(b) Find the value of ∠R and ∠S if ∠P : ∠Q = 1 : 4. (2)