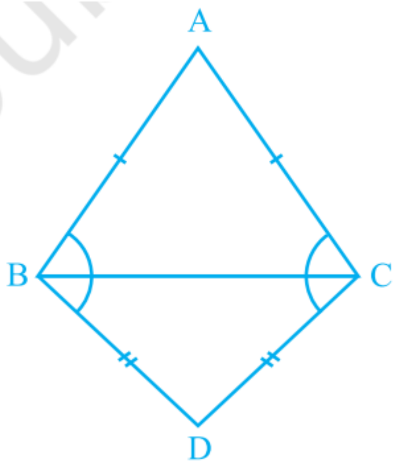
THE VILLAGE
INTERNATIONAL SCHOOL
"We Nurture Dreams"

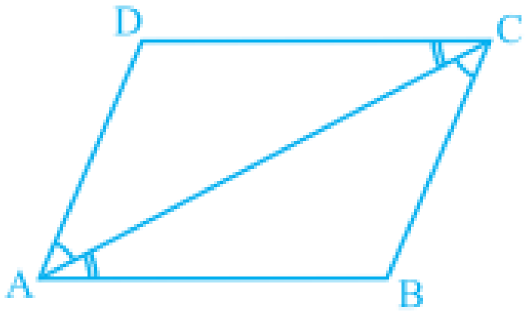
Date: 10/11/23 GRADE: IX	MONTHLY TEST -02(2023-24) MATHEMATICS	Max marks: 20 Time: 50 Minutes

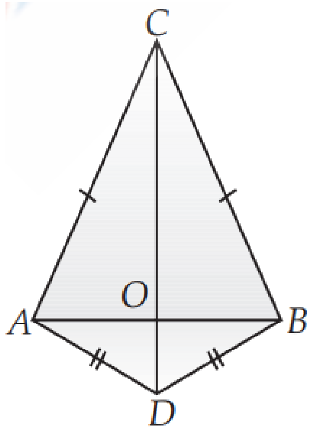
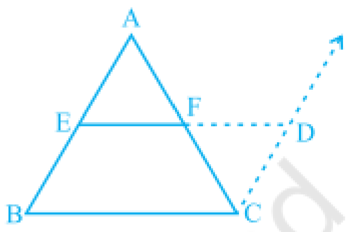
General Instructions:

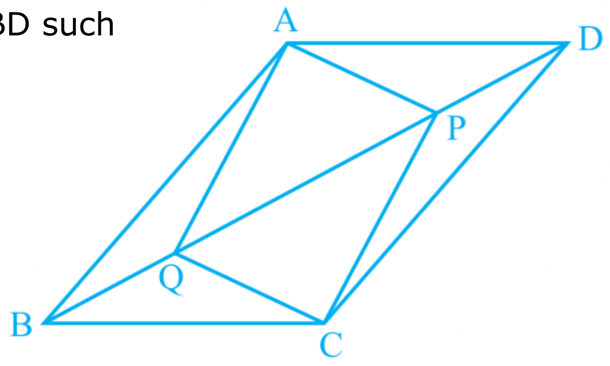
1. There are 10 questions in the question paper. All questions are compulsory.
2. The question paper has 4 sections A, B, C and D.
3. Section A has 5 MCQs carrying 1 mark each.
4. Section B has 2 VERT SHORT ANSWER TYPE QUESTIONS carrying 2 marks each.
5. Section C has 2 SHORT ANSWER TYPE QUESTIONS carrying 3 marks each.
6. Section D has 1 LONG ANSWER TYPE QUESTION carrying 5 marks.

Qn No	SECTION A MULTIPLE CHOICE QUESTIONS	Marks Allocated
1	In ΔABC and ΔPQR three equality relations between same parts are as follows: AB=QP, <B=<P and BC=PR. State which of the following congruence rule applies here a) SSS b) SAS c) ASA d) RHS	1
2	If ΔABC≅ ΔPQR and ΔABC is not congruent to ΔRPQ, which of the following is **not** true? a) BC=PQ b) AB=PQ c) AC=PR d) QR=BC	1
3	If all the three angles of a triangle are equal, then each one of them is equal to a) 90^0 b) 45^0 c) 60^0 d) 30^0	1

4	If the diagonals of a parallelogram are equal then it is a a) Trapezium b) Kite c) Rectangle d) Rhombus	1
5	Which of the following is the necessary condition for a quadrilateral to be a parallelogram? (a) Diagonals bisect each other. (b) Opposite angles are equal. (c) Opposite sides are equal and parallel to each other. (d) All of the above	1
	SECTION B **VERY SHORT ANSWER TYPE QUESTIONS**	
6	ABC and DBC are two isosceles triangles on the same base BC. Show that ∠ABD = ∠ACD.  In ΔABC, we have AB = AC [ABC is an isosceles triangle] ∴ ∠ABC = ∠ACB ...(1) [Angles opposite to equal sides of a Δ are equal] Again, in ΔBDC, we have BD = CD [BDC is an isosceles triangle] ∴ ∠CBD = ∠BCD ...(2) [Angles opposite to equal sides of a triangle are equal] Adding (1) and (2), we have ∠ABC + ∠CBD = ∠ACB + ∠BCD ⇒ ∠ABD = ∠ACD.	2

7	Prove that a diagonal of a parallelogram divides it into two congruent triangles.  Let ABCD be a parallelogram and AC be a diagonal. Observe that the diagonal AC divides parallelogram ABCD into two triangles, namely, Δ ABC and Δ CDA. We need to prove that these triangles are congruent. In Δ ABC and Δ CDA, note that BC || AD and AC is a transversal. So, ∠ BCA = ∠ DAC (Pair of alternate angles) Also, AB || DC and AC is a transversal. So, ∠ BAC = ∠ DCA (Pair of alternate angles) and AC = CA (Common) So, Δ ABC ≅ Δ CDA (ASA rule) or, diagonal AC divides parallelogram ABCD into two congruent triangles ABC and CDA.	2
	SECTION C **SHORT ANSWER TYPE QUESTIONS**	

8	AB is a line segment. C and D are points on opposite side of AB such that each of them is equidistant from the points A and B. Show that line CD is the perpendicular bisector of AB.  AB is a line segment. C and D are points on opposite sides of AB such that CA = CB ...(i) and DA = DB ...(ii) In ΔCAD and ΔCBD CA = CB [from eqn. (i)] AD = BD [from eqn. (ii)] and CD = CD [Common side] ΔCAD ≅ΔCBD [By SSS Congruence rule] or, <ACD = <BCD [By CPCT] or <ACO = <BCO ...(iii) In ΔCAO and ΔCBO CA = CB [from eqn. (i)] <ACO = <BCO [from eqn. (iii)] and CO = CO [Common side] ΔCAO ≅ ΔCBO [By SAS Congruence rule] or, AO = BO ...(iv) [By CPCT] and <AOC = <BOC ...(v) [By CPCT] Since AB is a line segment, so we use the property of linear pair and find the measure of ÐAOC or ÐBOC. AB is a line segment. So, <AOC + <BOC= 180° or,<AOC + <AOC= 180° [from eqn. (v)] or, 2<AOC = 180° or, <AOC = 180 /2 ° or, <AOC = 90° AO= BO [From eqn. (iv)] <BOC = <AOC = 90° each	3
9	State and prove The mid-point theorem.  In the figure E and F are mid-points of AB and AC respectively and CD || BA. Δ AEF ≅ Δ CDF (ASA Rule) So, EF = DF and BE = AE = DC (CPCT) Therefore, BCDE is a parallelogram. (both pairs of opposite sides are equal) This gives EF || BC. In this case, also note that EF = 1/2 ED = 1/2 BC.	3

	SECTION D **LONG ANSWER TYPE QUESTION**	
10	In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ. Show that: (i) Δ APD ≅ Δ CQB (ii) AP = CQ (iii) Δ AQB ≅Δ CPD (iv) AQ = CP (v) APCQ is a parallelogram  We have a parallelogram ABCD, BD is the diagonal and points P and Q are such that PD = QB (i) Since, AD || BC and BD is a transversal. ∴ ∠ADB = ∠CBD [∵ Alternate interior angles are equal] ⇒ ∠ADP = ∠CBQ Now, in ΔAPD and ΔCQB, we have AD = CB [Opposite sides of a parallelogram ABCD are equal] PD = QB [Given] ∠ADP = ∠CBQ [Proved] ∴ ΔAPD ≅ ΔCQB [By SAS congruency] (ii) Since, ΔAPD ≅ ΔCQB [Proved] ⇒ AP = CQ [By C.P.C.T.] (iii) Since, AB || CD and BD is a transversal. ∴ ∠ABD = ∠CDB ⇒ ∠ABQ = ∠CDP Now, in ΔAQB and ΔCPD, we have QB = PD [Given] ∠ABQ = ∠CDP [Proved] AB = CD [Y Opposite sides of a parallelogram ABCD are equal] ∴ ΔAQB = ΔCPD [By SAS congruency] (iv) Since, ΔAQB = ΔCPD [Proved] ⇒ AQ = CP [By C.P.C.T.] (v) In a quadrilateral ΔPCQ, Opposite sides are equal. [Proved]	5
	THE END	