MATHEMATICS

WORKSHEET_210925

CHAPTER 07 TRIANGLES

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

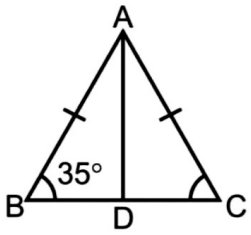
Questions 1 to 10 carry 1 mark each.

1. Given two right-angled triangles ABC and PRQ, such that ∠A = 30°, ∠Q = 30° and AC = QP. Write the correspondence if triangles are congruent.

(a) ΔABC ≅ ΔPQR (b) ΔABC ≅ ΔPRQ

(c) ΔABC ≅ ΔRQP (d) ΔABC ≅ ΔQRP

2. In the given figure, AD is the median, then ∠BAD is



(a) 35° (b) 70° (c) 110° (d) 55°

3. It is given that ΔABC ≅ ΔFDE and AB = 5 cm, ∠B = 40° and ∠A = 80°. Then which of the following is true?

(a) DF = 5 cm, ∠F = 60° (b) DF = 5 cm, ∠E = 60°

(c) DE = 5 cm, ∠E = 60° (d) DE = 5 cm, ∠D = 40°

4. If ΔACB ≅ ΔEDF, then which of the following equations is/are true?

(I) AC = ED

(II) ∠C = ∠F

(III) AB = EF

(a) Only (I) (b) (I) and (III) (c) (II) and (III) (d) All of these

5. If AB = QR, BC = PR and CA = PQ in ΔABC and ΔPQR, then:

(a) ΔABC ≅ ΔPQR (b) ΔCBA ≅ ΔPRQ (c) ΔBAC ≅ ΔRPQ (d) ΔBCA ≅ ΔPQR

6. If in ΔACB and ΔPQR, AC = PQ and BC = RQ, then to show ΔACB ≅ ΔPQR by SAS congruence rule which one of the following is needed?

(a) ∠A = ∠P (b) ∠A = ∠Q (c) ∠B = ∠R (d) ∠C = ∠Q

7. In ΔABC, BC = AB and ∠B = 80°, then ∠A is equal to:

(a) 80° (b) 40° (c) 50° (d) 100°

8. If ΔABC ≅ ΔPQR and ΔABC is not congruent to ΔRPQ, then which of the following is not true?

(a) BC= PQ (b) AC = PR (c) QR= BC (d) AB = PQ

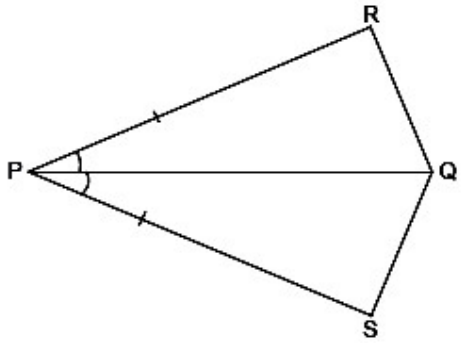
In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(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 we draw two triangles with angles 30° 70°, and 80° and the length of the sides of one triangle be different than that of the corresponding sides of the other triangle then two triangles are not congruent.
Reason (R): If two triangles are constructed which have all corresponding angles equal but have unequal corresponding sides, then two triangles cannot be congruent to each other.

10. **Assertion (A):** In a quadrilateral PQRS, PR = PS and PQ bisect ∠P by SAS congruency criteria.

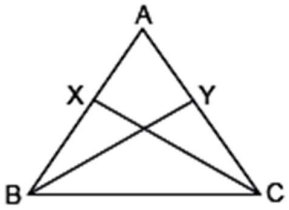


Reason (R): SAS congruency axiom state that if two sides and their including angle of one triangle is equal to the corresponding two sides and including angle of other triangle, then Both the triangles are congruent.

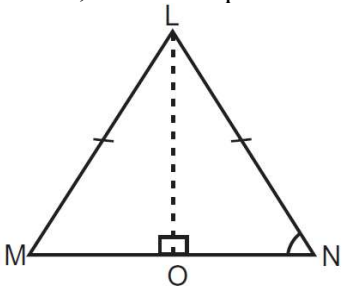
SECTION – B

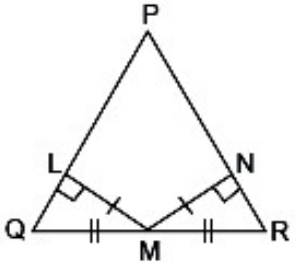
Questions 11 to 14 carry 2 marks each.

11. In the figure below, ABC is a triangle in which AB = AC. X and Y are points on AB and AC such that AX = AY. Prove that ΔABY ≅ ΔACX.



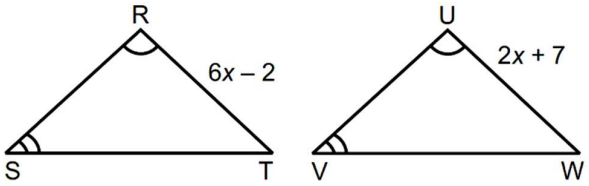
12. In the below left figure, ΔLMN is an isosceles triangle, where LM = LN and LO, is an angle bisector of ∠MLN, Prove that point 'O' is the mid-point of side MN.





13. In the above right sided figure, LM = MN, QM = MR, ML ⊥ PQ and MN ⊥ PR. Prove that PQ = PR.

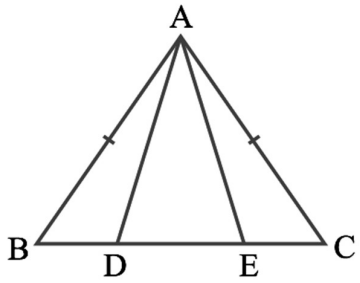
14. In ΔRST, RT = 6x – 2. In ΔUVW, UW = 2x + 7, ∠R = ∠U, and ∠S = ∠V. What must be the value of x in order to prove that ΔRST ≅ ΔUVW?



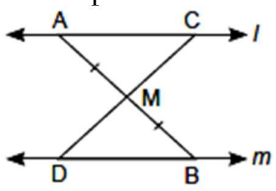
SECTION – C

Questions 15 to 17 carry 3 marks each.

15. In the given figure, AB = AC and BE = CD. Prove that AD = AE.



16. In the given figure, *l* || *m* and M is the mid-point of line segment AB. Prove that M is also the mid-point of any line segment CD having its end points C and D on *l* and *m* respectively.



17. Prove that angles opposite to equal sides of an isosceles triangle are equal.

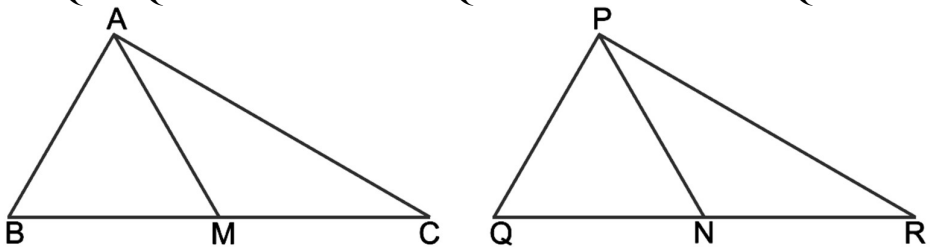
OR

ΔABC is an isosceles triangle in which AB = AC. Side BA is produced to D such that AD = AB. Show that ∠BCD is a right angle.

SECTION – D

Questions 18 carry 5 marks.

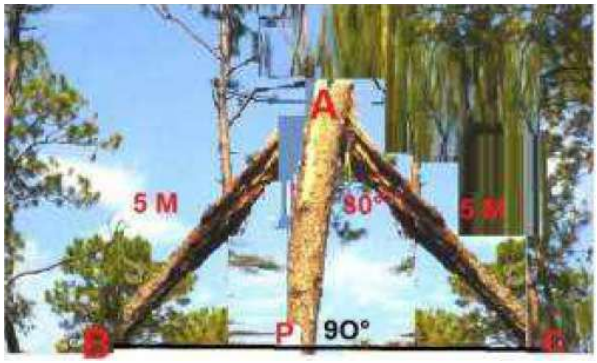
18. In the below figure, two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of ΔPQR. Show that ΔABC ≅ ΔPQR.

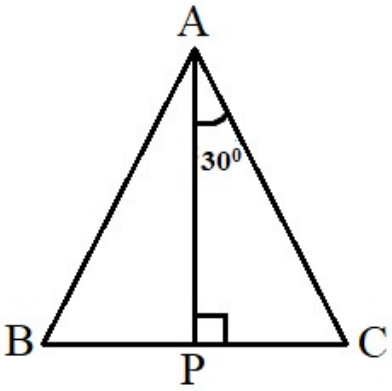


SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

19. Aditya and his friends went to a forest, they saw a big tree got broken due to heavy rain and wind. Due to this rain the big branches AB and AC with lengths 5m fell down on the ground. Branch AC makes an angle of 30° with the main tree AP. The distance of Point B from P is 4 m. You can observe that ΔABP is congruent to ΔACP.



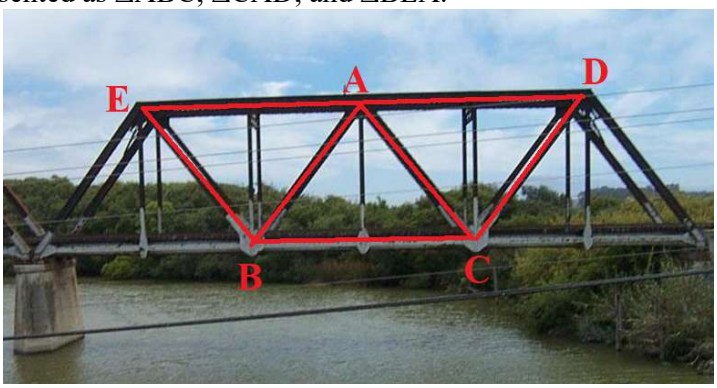


(a) Show that ΔABP is congruent to ΔACP (1)
(b) Find the value of ∠ACP? (2)

OR

What is the total height of the tree? (2)
(c) Find the value of ∠BAP? (1)

20. Truss bridges are formed with a structure of connected elements that form triangular structures to make up the bridge. Trusses are the triangles that connect to the top and bottom cord and two end posts. You can see that there are some triangular shapes are shown in the picture given alongside and these are represented as ΔABC, ΔCAD, and ΔBEA.



(a) If AB = CD and AD = CB, then prove ΔABC ≅ ΔCDA
(b) If AB = 7.5 m, AC = 4.5 m and BC = 5 m. Find the perimeter of ΔACD, if ΔABC ≅ ΔCDA by SSS congruence rule.
(c) If ΔABC ≅ ΔFDE, AB = 5 cm, ∠B = 40° and ∠A = 80°. Then find the length of DF and ∠E.