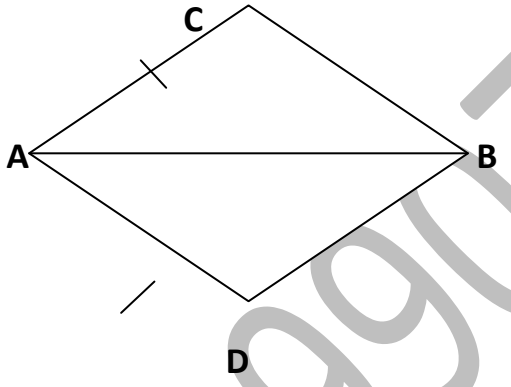
MATHEMATICS CLASS IX
CHAPTER-5 TRIANGLES

Q.1. In a quadrilateral ABCD, AC=AD and AB bisects <A (See figure). Show that ΔABC = ΔABD. What can you say about BC and BD?

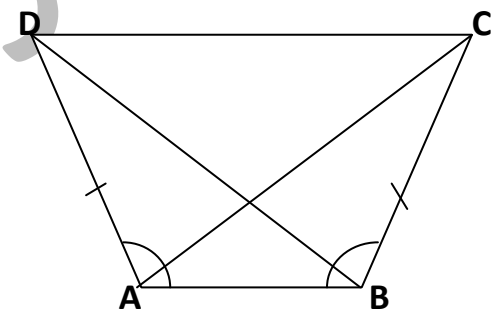


Q.2. ABCD is a quadrilateral in which AD = BC and <DAB = <CBA.Prove that

(i) ΔABD = ΔBAC

(ii) BD = AC

(iii) <ABD = <BAC



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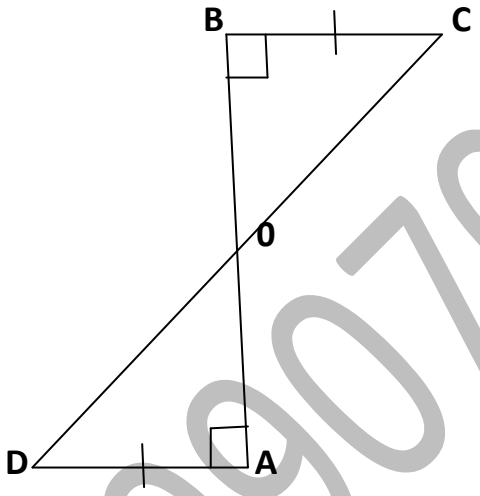
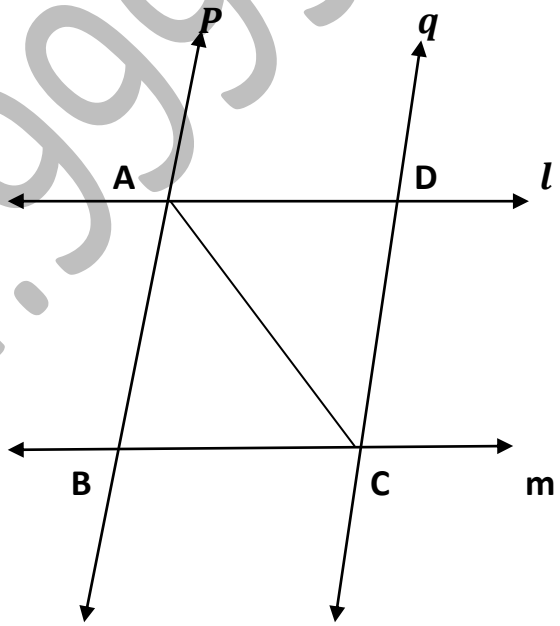
Q.3. AD and BC are equal perpendiculars to a line segment AB(see figure). Show that CD bisects AB.



Q.4. l and m are two parallel lines intersected by another pair of parallel lines p and q in the given figure. Show that ΔABC ≅ ΔCDA.



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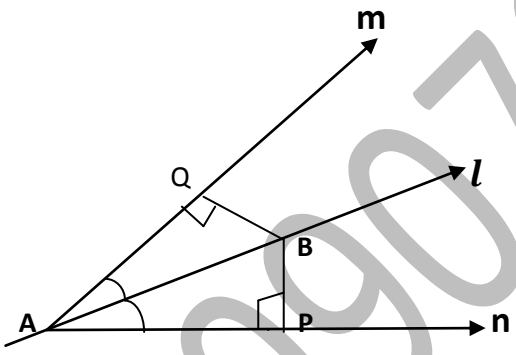
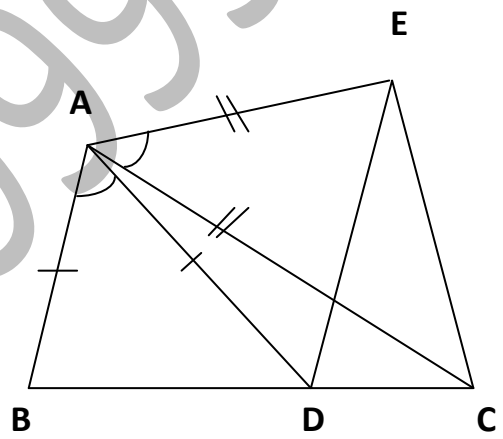
Q.5. Line l is the bisector of <A and B is any point on l. BP and BQ are perpendiculars from B to the arms of <A (see figure). Show that

(i) ΔAPB ≅ ΔAQB

(ii) BP = BQ or B is equidistant from the arms of <A.



Q.6. In following figure, AC = AE, AB = AD and <BAD = <EAC. Show that BC = DE.



Q.7. AB is a line segment and P is its mid-point. D and E are points on the same side of AB, such that <BAD = <ABE and <EPA = <DPB (see figure). Show that

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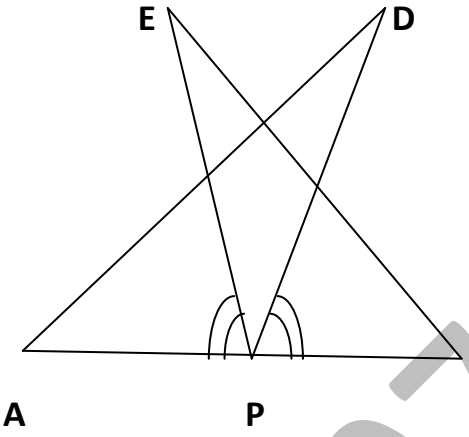
(i) ΔDAP ≅ ΔEBP (ii) AD = BE



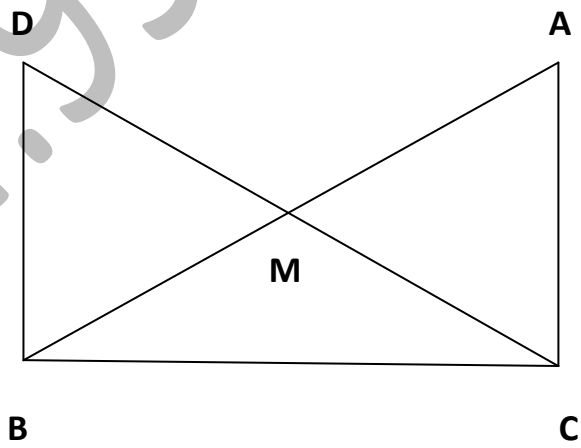
Q.7. In right angled ΔABC, right angled at C, M is the mid point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B (see figure). Show that

(i) ΔAMC ≅ ΔBMD

(ii) <DBC is a right angle.

(iii) ΔDBC ≅ ΔACB

(iv) CM = $\frac{1}{2}$ AB



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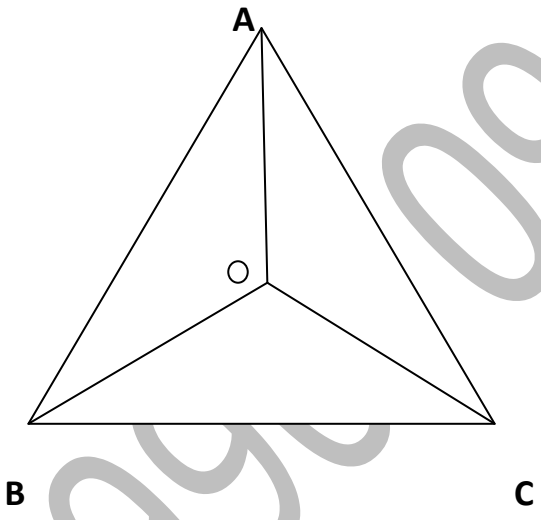
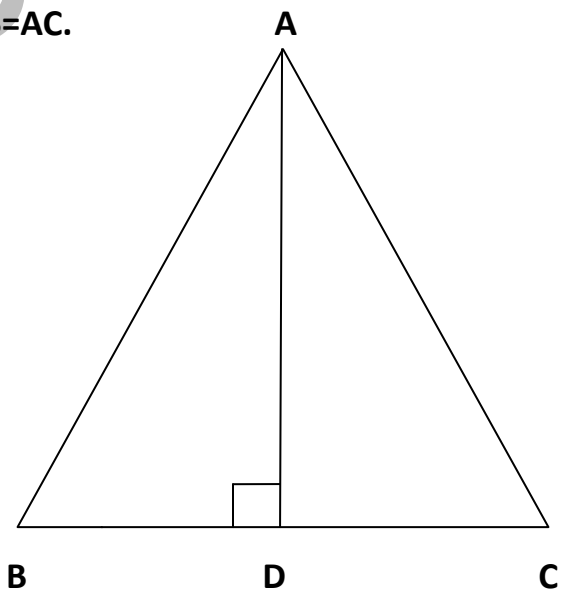
Q.8. In an isosceles ΔABC with AB = AC, the bisector of <B and <C intersect each other at O. Join A to O. Show that

(i) OB = OC **(ii) AO bisects <A.**



Q.9. In Δ ABC, AD is the perpendicular bisector of BC (see figure). Show that ΔABC is an isosceles triangle in which AB=AC.



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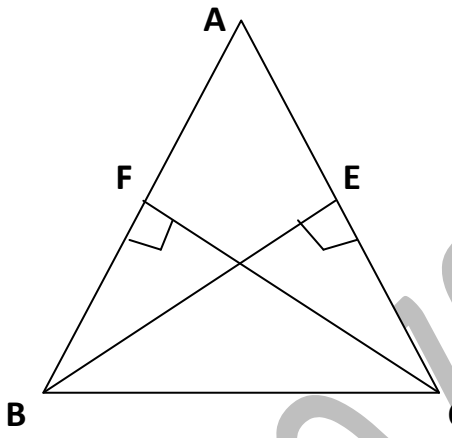
Q.10. Δ ABC is an isoceles triangle in which attitudes BE and CF are drawn to equal sides AC and AB, respectively (see figure). Show that these altitudes are equal.

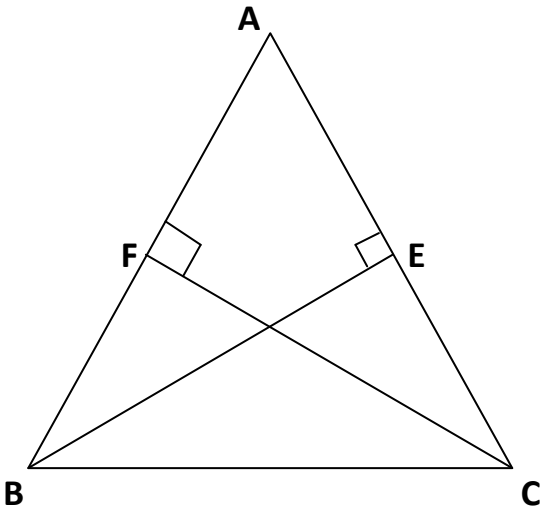


Q.11. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal (see figure). Show that

(i) Δ ABE ≅ ΔACF

(ii) AB = AC

i.e., Δ ABC is an isosceles triangle.



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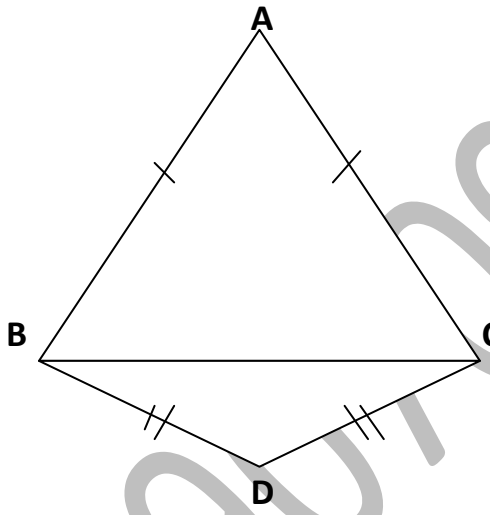
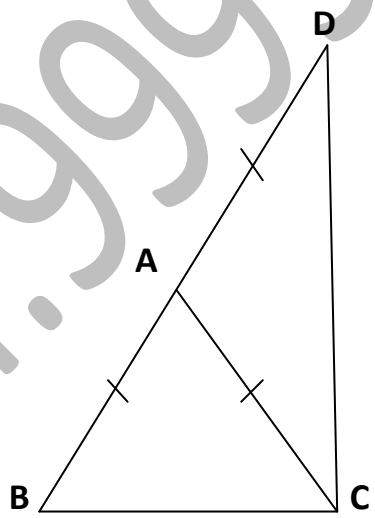
Q.12. ΔABC and ΔDBC are two isosceles triangles on the same base BC (see figure). Show that <ABD = <ACD.



Q.13. ΔABC is an isosceles triangle in which AB= AC. Side BA is produced to D such that AD = AB (see figure). Show that <BCD is a right angle.



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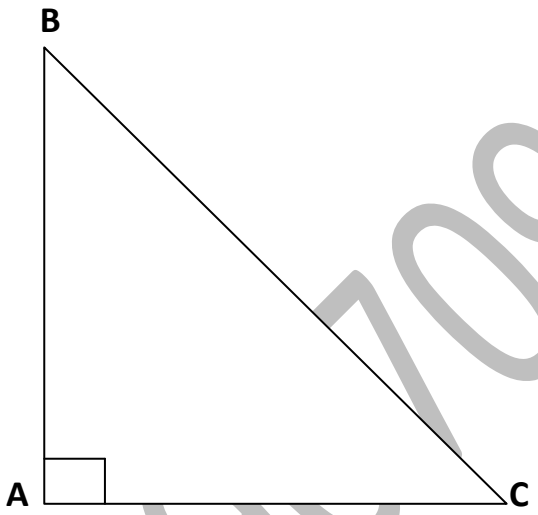
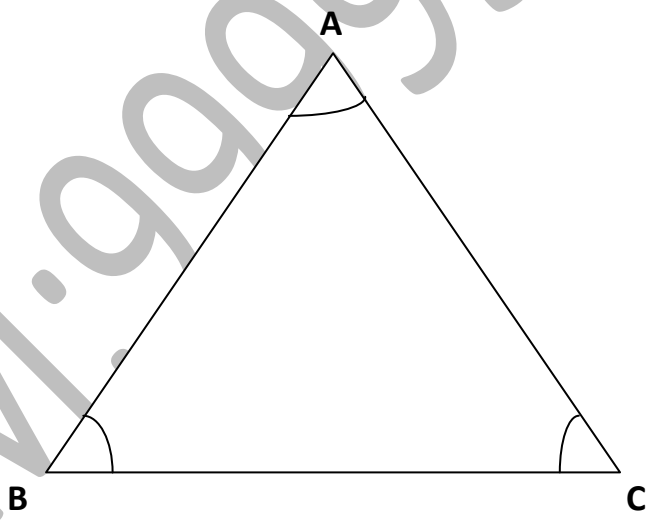
Q.14. ΔABC is a right angled triangle in which $\angle A = 90^\circ$ and AB = AC. Find $\angle B$ and $\angle C$.



Q.15. Show that the angles of an equilateral triangle are 60° each.



Q.16. In the given figure, ABC is a right triangle, right angled at B, E is the mid point of AC. Prove that EA = EB = EC.

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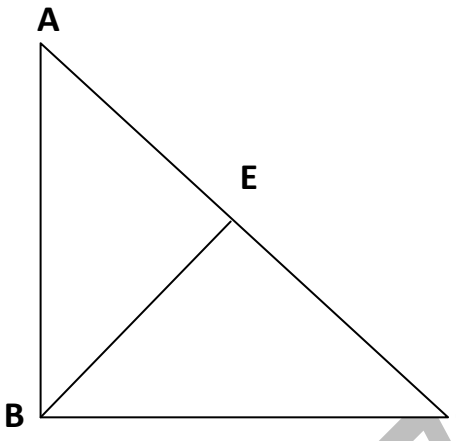
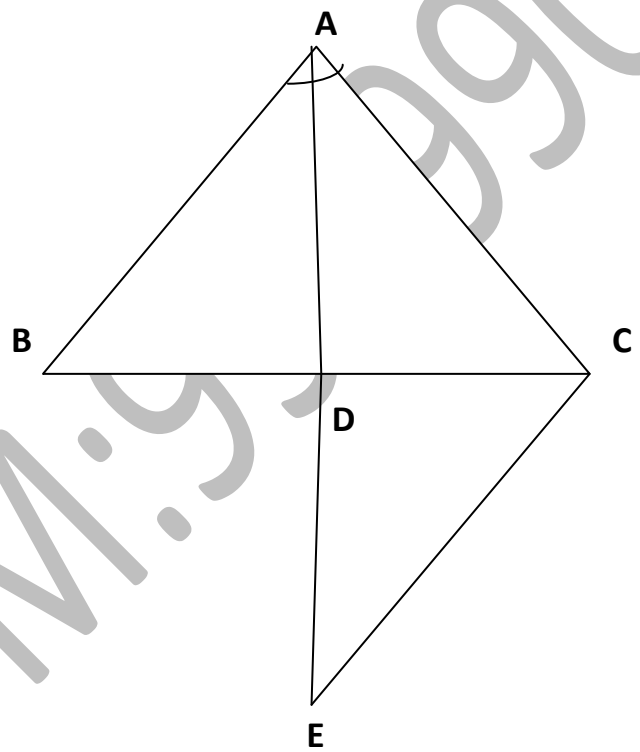


Q.17. If bisector of an angle of a triangle also bisects the opposite side, then prove that the triangle is an isosceles.



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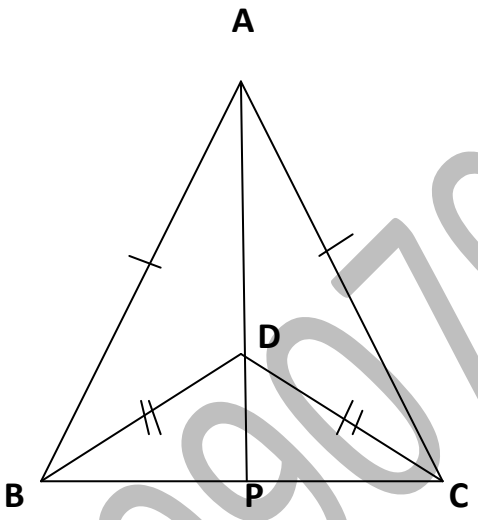
Q.18. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (see figure). If AD is extended to intersect BC at P, then show that



(i) ΔABD ≅ ΔACD

(ii) ΔABP ≅ ΔACP

(iii) AP bisects ∠A as well as ∠D.

(iv) AP is the perpendicular bisector of BC.

Q.19. AD is an altitude of an isosceles ΔABC in which AB = AC. Show that

(i) AD bisects BC.

(ii) AD bisects ∠A

Q.20. Two sides AB and BC and median AM of ΔABC are respectively equal to sides PQ and QR and median PN of ΔPQR. Show that

(i) ΔABM ≅ ΔPQN.

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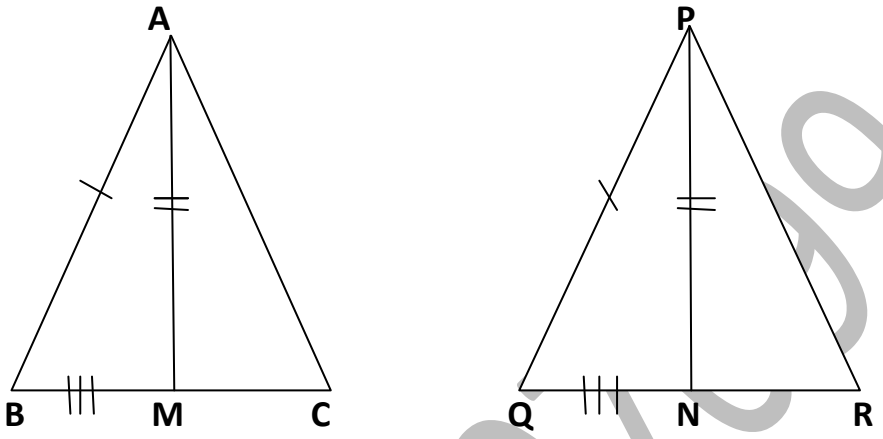
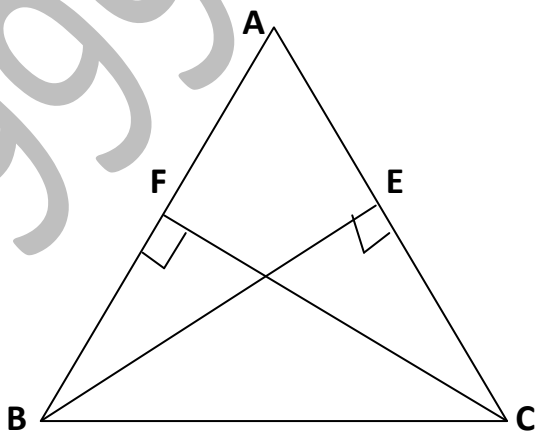
(ii) ΔABC ≅ ΔPQR.



Q.21. BE and CF are two equal altitudes of a ΔABC. Using RHS congruence rule, prove that the ΔABC is an isosceles.



Q.22. ΔABC is an isosceles triangle with AB = AC. Draw AP⊥BC to show that ∠B = ∠C.

Q.23. In a right angled triangle, one acute angle is double the other. Prove that the hypotenuse is double the smallest side.

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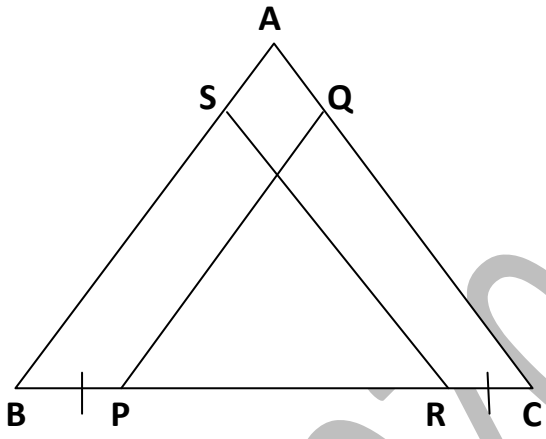
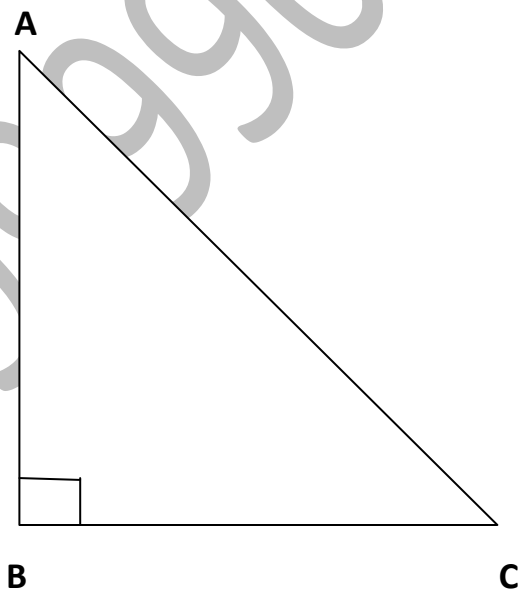
Q.24. In the figure given below, BA || PQ, CA || RS and BP = RC.



Q.25. Show that in a right angled triangle, the hypotenuse is the longest side.



Q.26. In the given figure, sides AB and AC of ∆ ABC are extended to points P and Q, respectively. Also,angle <PBC < <QCB. Show that AC > AB.

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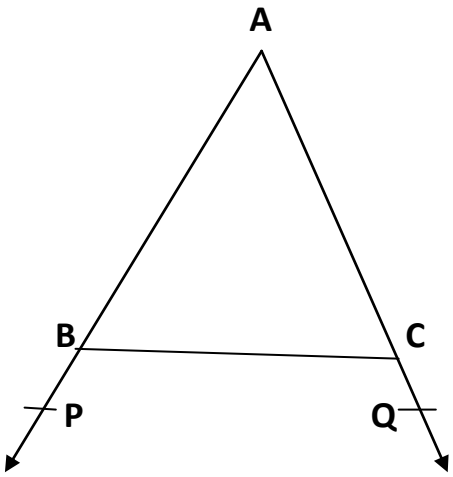
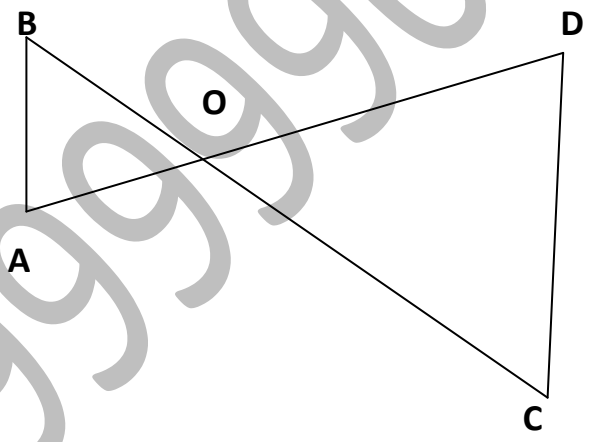


Q.27. In the given figure, $< B < < A$ and $< C < < D$, then show that AD < BC.



Q.28. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see figure). Show that $< A > < C$ and $< B > < D$.

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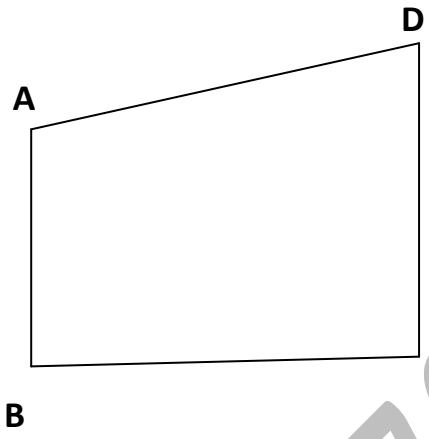
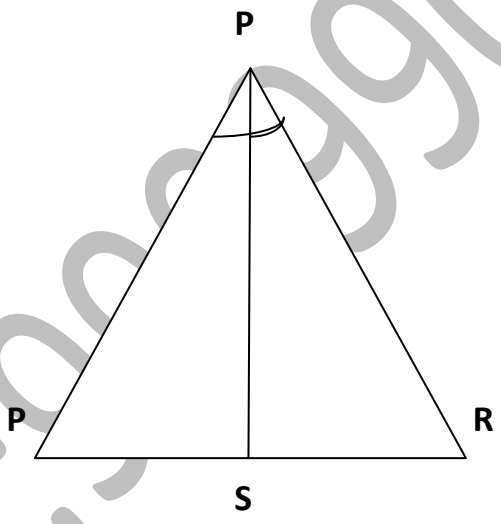


Q.29. In the given figure, PR > PQ and PS bisects $< QPR$. Prove that $< PSR >$ $< PSQ$.



Q.30. Show that all line segments drawn from a given point not on it, the perpendicular line segment is the shortest.

Q.31. ABC is a triangle. Locate a point in the interior of ∆ABC which is equidistant from all the vertices of ∆ABC.

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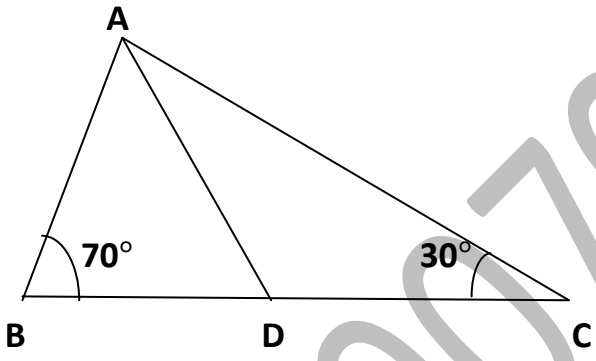
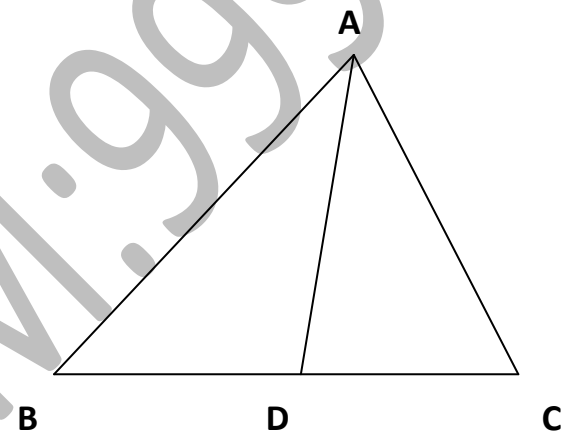
Q.32. In a triangle, locate a point in its interior which is equidistant from all the sides of the triangle.

Q.33. In the following figure, AD bisects $<$A. Then, find the relation between the sides AB,BD and DC.



Q.34. In ΔABC, if $< A$ = 40° and $< B$ = 60°, then find the longest side of ΔABC.

Q.35. In the given figure, AB > AC. Then, what is the relation between the sides AB and AD?



Q.36. It is given that ΔABC $\cong$ ΔFDE and AB = 5 CM, $< B$ = 40° and $< A$ = 80°. Then, find the length of DF and also measurement of the $< E$.

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Q.37. In $\Delta PQR, < R = < P$, QR = 4 cm and PR = 5 cm and PR = 5 cm, then find the length of PQ.

Q.38. AD is a median and BL and CM are perpendiculars drawn from B and C respectively on AD produced. Prove that BL = CM.

Q.39. In ΔABC, AB = AC, $< A$ = (5x + 20°) and $< B = \frac{2}{5} th$ of $< A$. Find the measure of $< A$.

Q.40. If the altitudes from two vertices of a triangle to the opposite sides are equal, then prove that the triangle is isosceles.

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