CLASS IX: CHAPTER - 7
TRIANGLES

1. Line segment joining the mid point of any side with the opposite vertex is
(a) altitude (b) median c) perpendicular bisector (d) angle bisector

2. The length of perpendicular drawn from the opposite vertex to any side is
(a) altitude (b) median c) perpendicular bisector (d) angle bisector

3. The point of intersection of all the altitudes of a triangle is
(a) orthocentre (b) incentre c) circumcentre (d) centroid

4. The point of intersection of the perpendicular bisector of all sides of a triangle is
(a) orthocentre (b) incentre c) circumcentre (d) centroid

5. In a triangle, the angle opposite to the longest side is:
(a) greater than 60^0 (b) measure of 50^0
(c) greater than 90^0 (d) none of these

6. The point of intersection of all the medians of a triangle is
(a) orthocentre (b) incentre c) circumcentre (d) centroid

7. In a triangle ABC, if $2\angle A = 3\angle B = 6\angle C$, then the measure of $\angle A$ is
(a) 30^0 (b) 75^0 c) 90^0 (d) 60^0

8. In a triangle ABC, if $2\angle A = 3\angle B = 6\angle C$, then the measure of $\angle B$ is
(a) 30^0 (b) 75^0 c) 90^0 (d) 60^0

9. In a triangle ABC, if $2\angle A = 3\angle B = 6\angle C$, then the measure of $\angle C$ is
(a) 30^0 (b) 75^0 c) 90^0 (d) 60^0

10. In a triangle ABC, if $\angle A - \angle B = 33^0$ and $\angle B - \angle C = 18^0$, then the measure of $\angle A$ is
(a) 88^0 (b) 55^0 c) 37^0 (d) 60^0

11. In a triangle ABC, if $\angle A - \angle B = 33^0$ and $\angle B - \angle C = 18^0$, then the measure of $\angle B$ is
(a) 88^0 (b) 55^0 c) 37^0 (d) 60^0

12. In a triangle ABC, if $\angle A - \angle B = 33^0$ and $\angle B - \angle C = 18^0$, then the measure of $\angle C$ is
(a) 88^0 (b) 55^0 c) 37^0 (d) 60^0

13. In a triangle ABC, if $\angle A + \angle B = 65^0$ and $\angle B + \angle C = 140^0$, then the measure of $\angle A$ is
(a) 40^0 (b) 25^0 c) 115^0 (d) 60^0

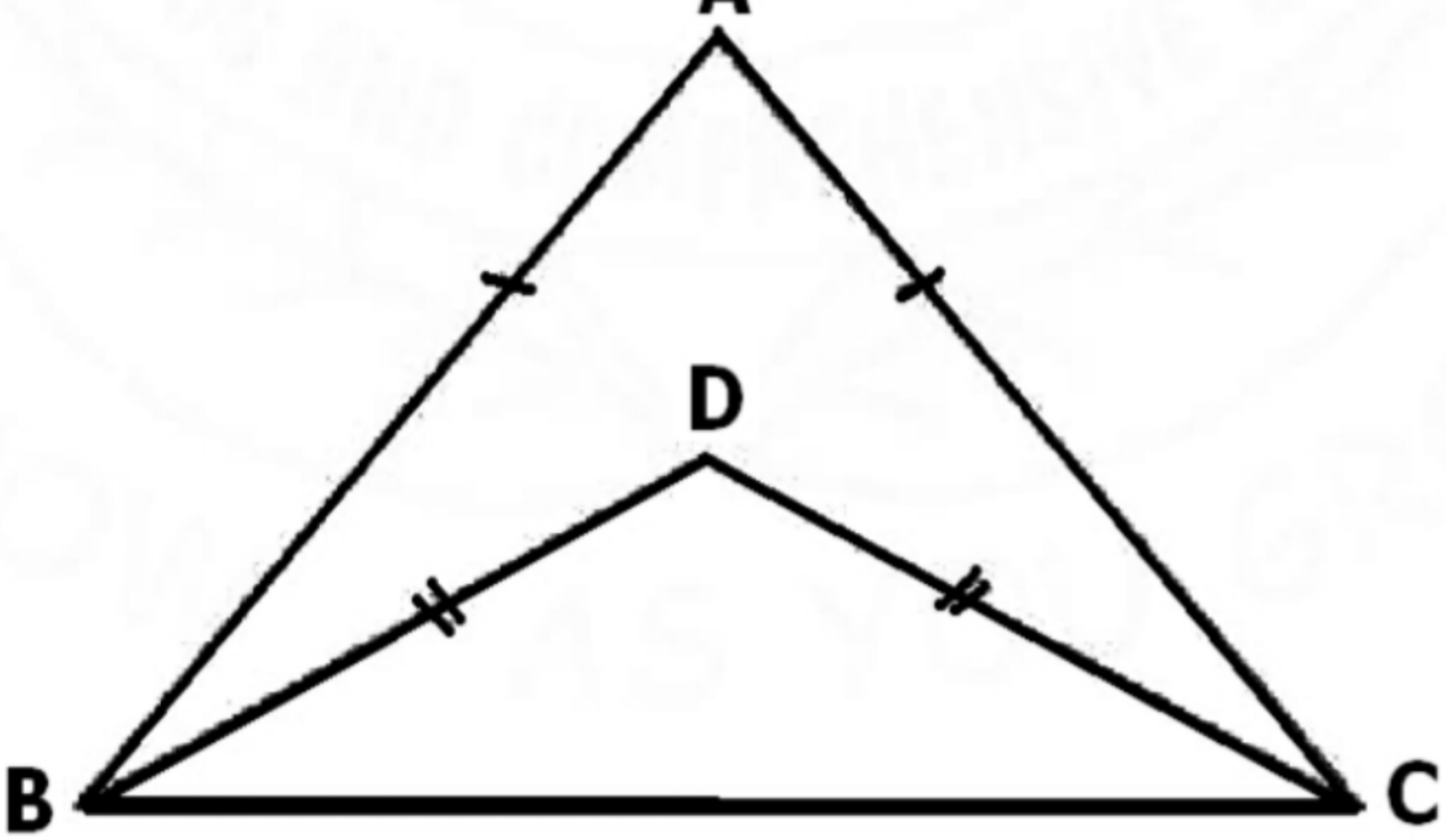
14. In a triangle ABC, if $\angle A + \angle B = 65^0$ and $\angle B + \angle C = 140^0$, then the measure of $\angle B$ is
(a) 40^0 (b) 25^0 c) 115^0 (d) 60^0

15. In a triangle ABC, if $\angle A + \angle B = 65^0$ and $\angle B + \angle C = 140^0$, then the measure of $\angle C$ is
(a) 40^0 (b) 25^0 c) 115^0 (d) 60^0

CLASS IX: CHAPTER - 7
TRIANGLES

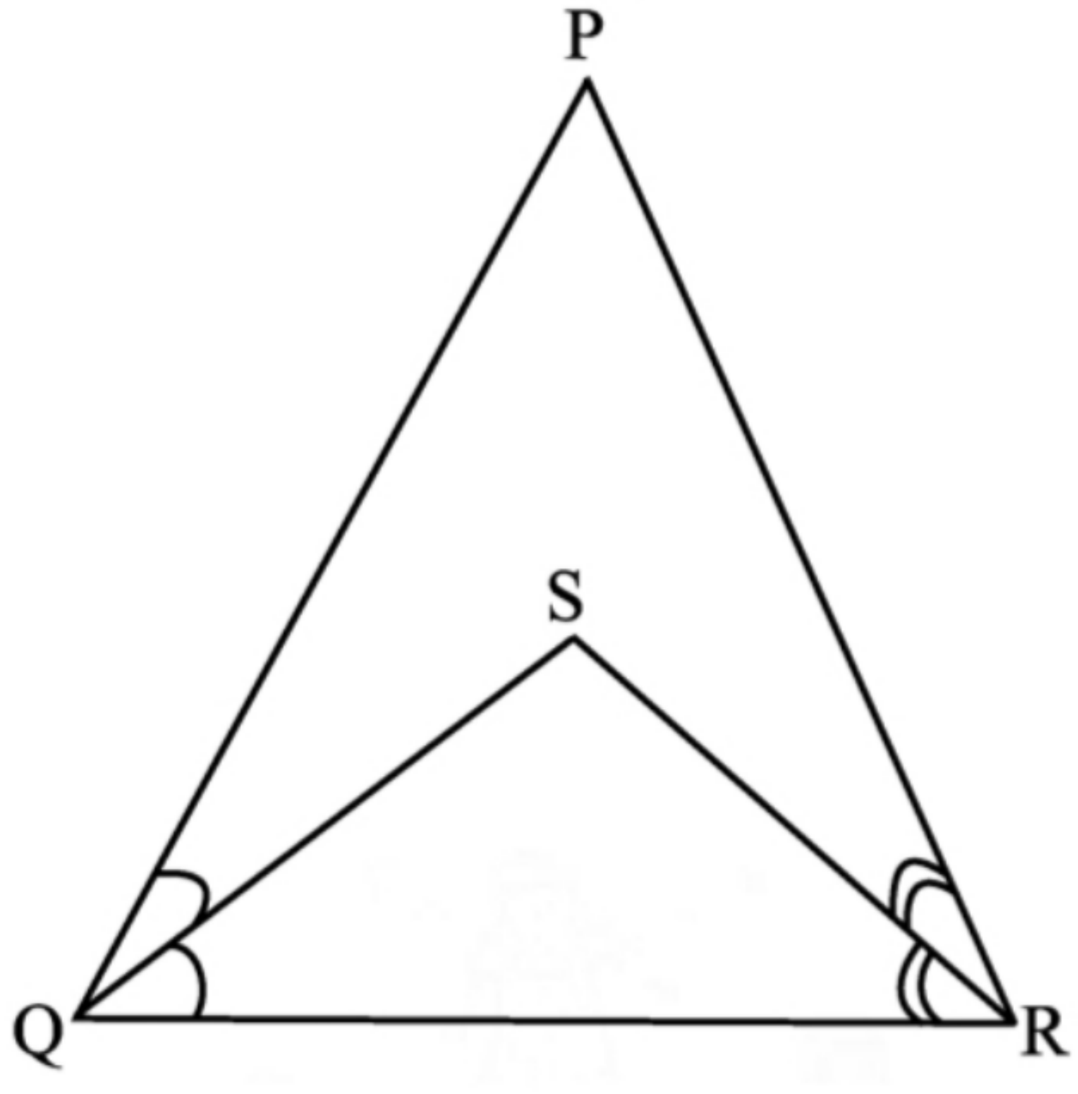
1. If one angle of a triangle is equal to the sum of other two angles, then the triangle is
(a) an Equilateral triangle (b) an Isosceles triangle
(c) an obtuse triangle (d) a right triangle .

2. In the given figure, the ratio $\angle ABD : \angle ACD$ is
(a) 1 : 1 (b) 2 : 1 (c) 1 : 2 (d) 2 : 3

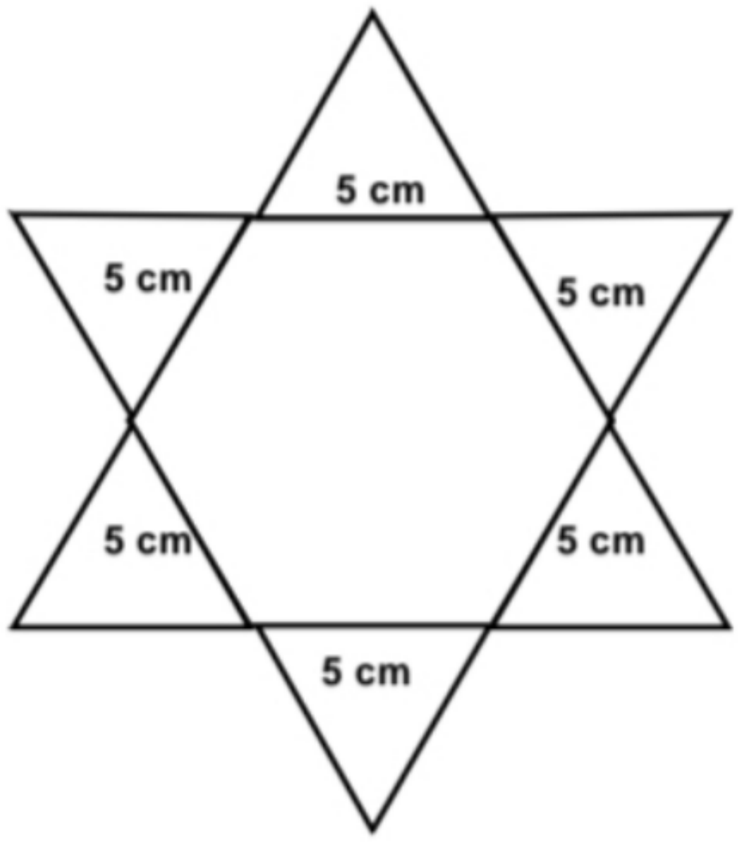


3. $\angle x$ and $\angle y$ are exterior angles of a ΔABC, at the points B and C respectively. Also $\angle B > \angle C$, then relation between $\angle x$ and $\angle y$ is
(a) $\angle x > \angle y$ (b) $\angle x < \angle y$ (c) $\angle x = \angle y$ (d) none of these

4. In the given figure, PQ > PR, QS and RS are the bisectors of $\angle Q$ and $\angle R$ respectively, then
(a) SQ > SR (b) SQ < SR (c) SQ = SR (d) none of these



CLASS IX: CHAPTER - 7
TRIANGLES



1. How many equilateral triangles each of 1 cm and fill the given star rangoli?
(a) 200 (b) 300 (c) 150 (d) 350

2. In a triangle ABC, AC > AB and bisector of ∠A meets BC at D then ∠ADB is:
(a) acute angle (b) right angle
(c) obtuse angle (d) linear angle

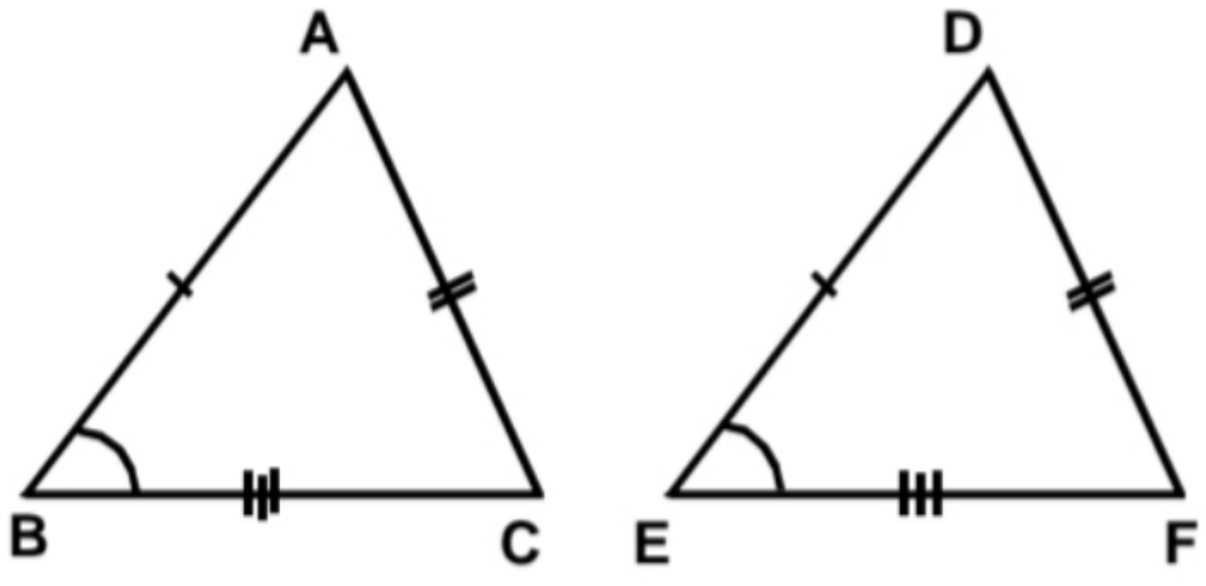
3. The difference between any two sides of a triangle is _____ the third side.
(a) equal to (b) less than (c) greater than (d) half

4. If two angles of a triangle are unequal then the side opposite side to the smaller angle is:
(a) greater (b) 90^0 (c) smaller (d) none of these

5. The sides opposite to two equal angles of a triangle are:
(a) not equal (b) congruent (c) may be congruent (d) not congruent

6. Which one of the following is the value of congruency?
(a) SAS (b) ASS (c) SSA (d) none of these

7. By which congruence rule following triangles are congruent ?
(a) SAS (b) ASS (c) AAS (d) SSS



8. In a right triangle, if acute angle is double of other angle then hypotenuse is:
(a) equal to the smallest side (b) three times the smallest side
(c) twice the smallest side (d) smaller than any of the two sides

9. In a triangle ABC, if median BE = median CF then triangle is:
(a) Equilateral (b) Isosceles (c) Scalene (d) none of these.

10. The perimeter of a triangle is _____ the sum of its medians.
(a) equal to (b) less than (c) greater than (d) half of

CLASS IX: CHAPTER - 7
TRIANGLES

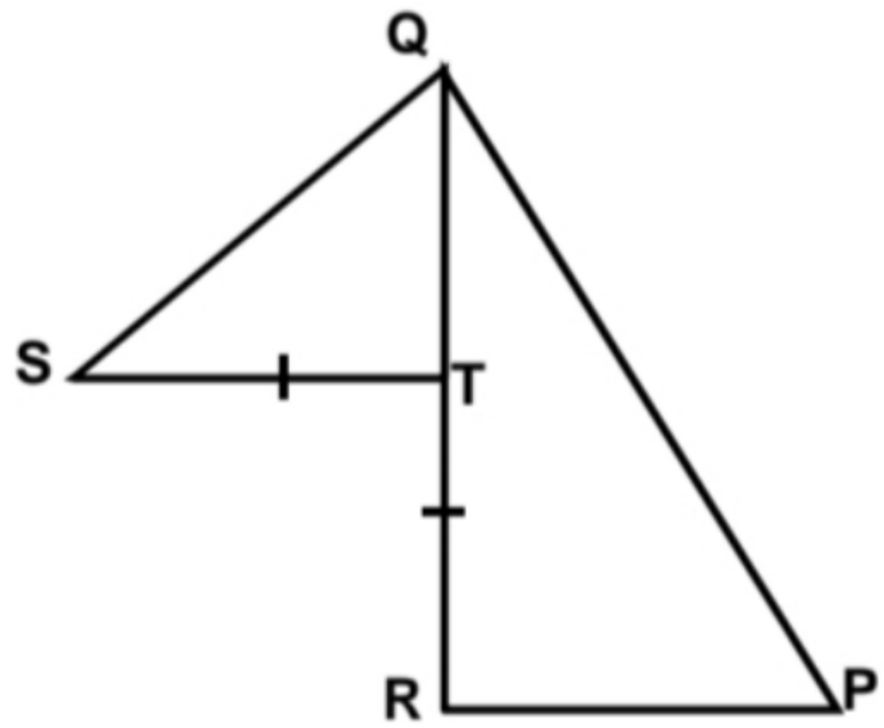
1. In a triangle, the angle opposite to the longer side is:
(a) larger (b) 90^0 (c) smaller (d) none of these

2. In a triangle side opposite to larger angle is
(a) longer (b) shorter (c) equal (d) none of these

3. In a triangle, the sum of its two sides is _____ third side.
(a) equal to (b) less than (c) greater than (d) none of these

4. The point of intersection of the angle bisector of all internal angles of a triangle is
(a) orthocentre (b) incentre c) circumcentre (d) centroid

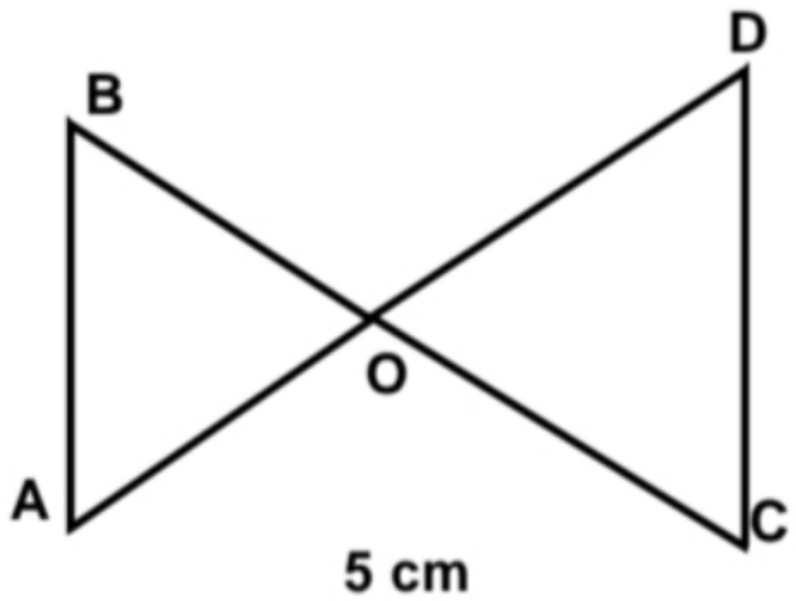
5. In fig, PQR is a triangle in which T is a point on QR and if S is a point such that RT = ST: then PQ + PR ___ QS
(a) PQ + PR $>$ QS (b) PQ + PR $<$ QS
(c) PQ + PR $=$ QS (d) PQ + PR $= \frac{1}{2}$ QS



6. The sum of three altitudes of triangle is _____ the sum of its three sides.
(a) equal to (b) less than
(c) greater than (d) none of these

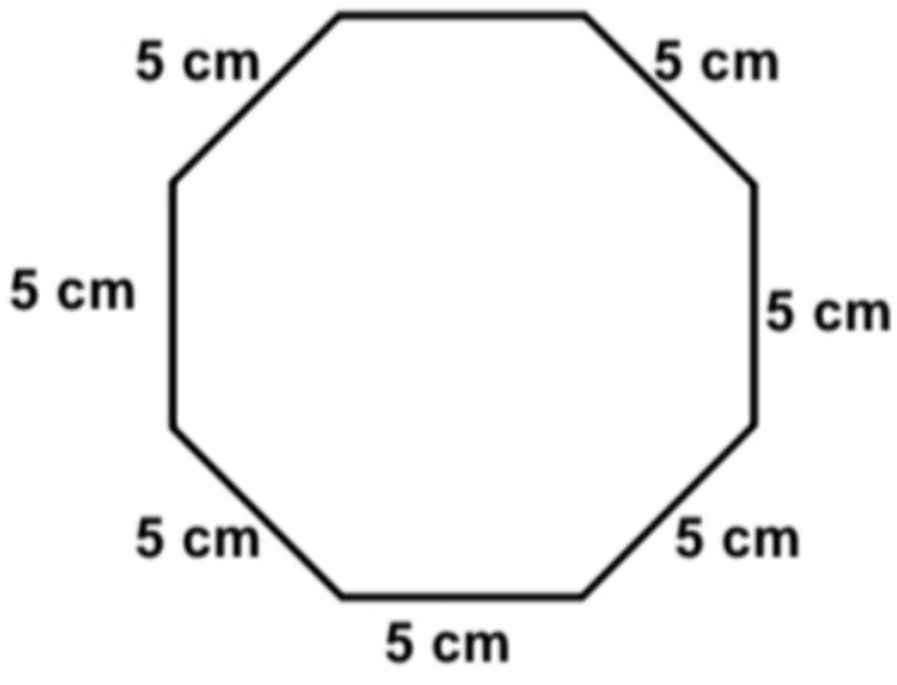
7. In a right angled triangle, _____ is the longest side.
(a) perpendicular (b) hypotenuse (c) base (d) none of these

8. In fig, $\angle B < \angle A$ and $\angle C < \angle D$ then relation between AD and BC is
(a) AD $>$ BC (b) AD $<$ BC
(c) AD = BC (d) none of these



9. In a triangle ABC, $\angle A = \angle B = 62\frac{1}{2}^0$ then the longest side is
(a) AC (b) BC (c) AB (d) none of these

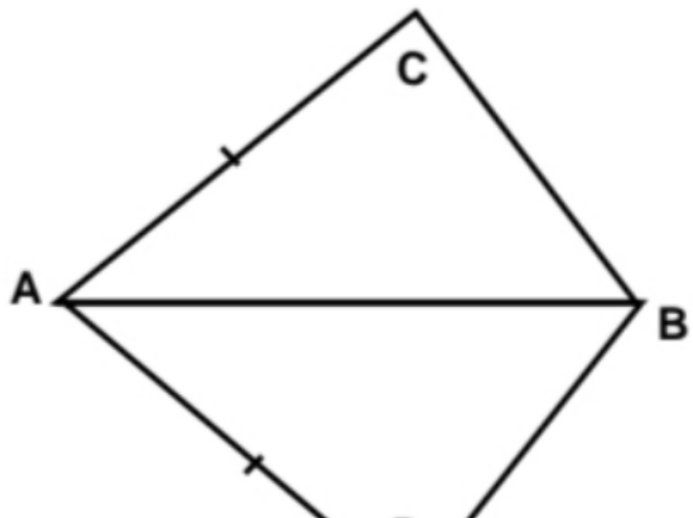
10. How many equilateral triangles each of 1 cm and fill the given hexagonal rangoli?
(a) 200 (b) 300 (c) 150 (d) 250



CLASS IX: CHAPTER - 7
TRIANGLES

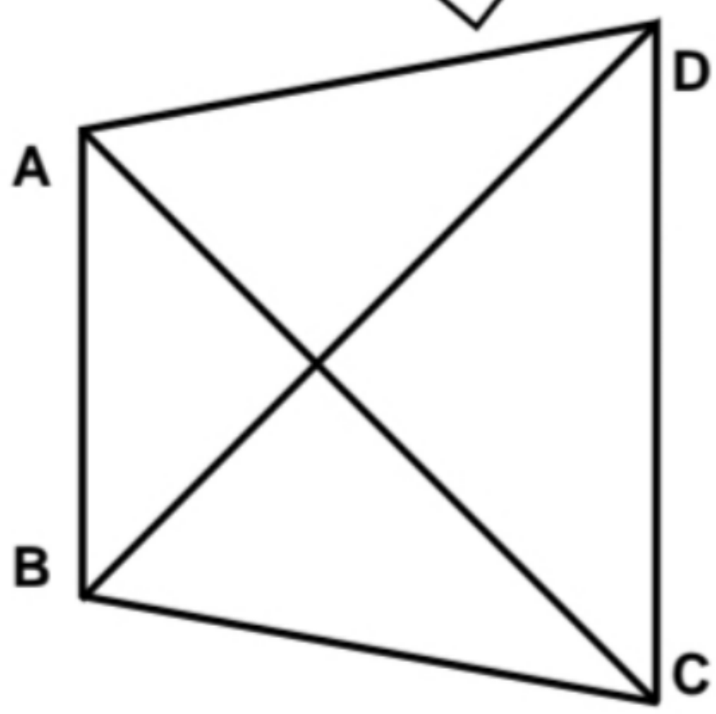
1. In quadrilateral ABCD, AC = AD and AB bisect ∠A and ΔABC ≅ ΔABD. The relation between BC and BD is

(a) BC > BD (b) BC < BD
(c) BC = BD (d) BC = (1/2)BD



2. In quadrilateral ABCD, AD = BC and ∠DAB = ∠CBA. If ΔABD ≅ ΔBAC. The relation between ∠ABD and ∠BAC is

(a) ∠ABD > ∠BAC (b) ∠ABD < ∠BAC
(c) ∠ABD = ∠BAC (d) ∠ABD = (1/2)∠BAC



3. ΔABC is right triangle in which $\angle A = 90^0$ and AB = AC. The values of ∠B and ∠D will be

(a) $\angle B = \angle C = 60^0$ (b) $\angle B = \angle C = 30^0$
(c) $\angle B = \angle C = 45^0$ (d) $\angle B = \angle C = 50^0$

5. The measure of each angle of an equilateral triangle is:

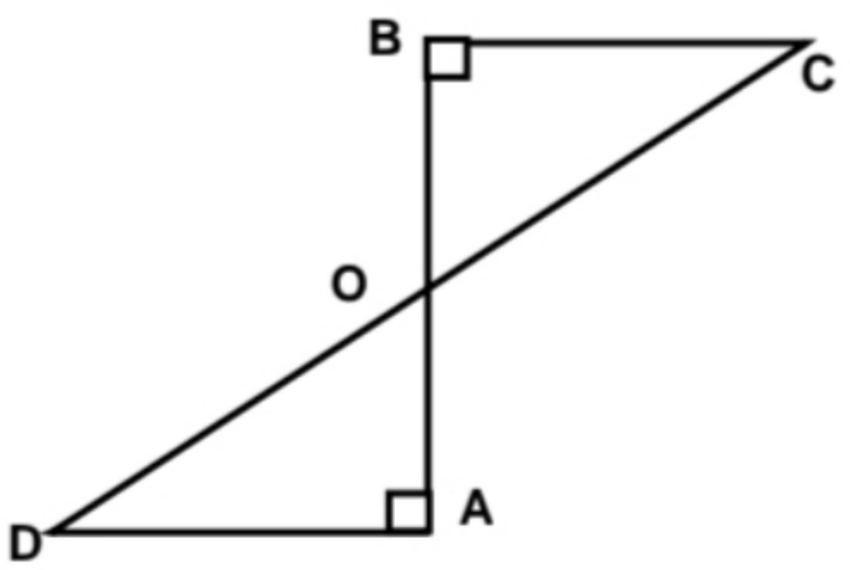
(a) 60^0 (b) 30^0 c) 45^0 (d) 40^0

6. If the vertical angle of a isosceles triangle is 400 then measure of other two angles will be

(a) 60^0, 60^0 (b) 70^0 , 70^0
(c) 50^0, 50^0 (d) 75^0, 75^0

7. If ∠A, ∠B and ∠C of ΔABC are equal then triangle is:

(a) Equilateral (b) Isosceles
(c) Scalene (d) none of these.



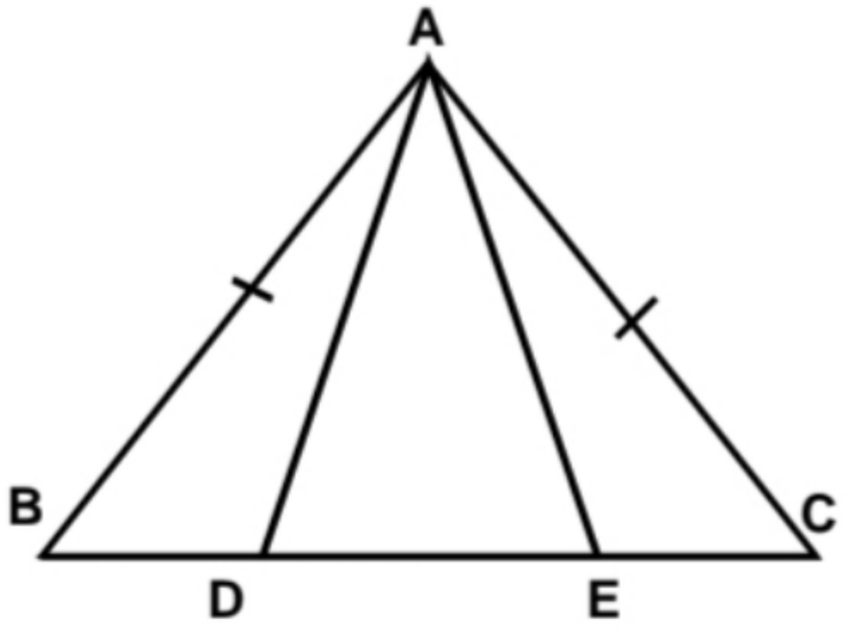
8. AC and BD are equal perpendicular to line segment AB. If ΔBOC ≅ ΔAOD, then the relation between OC and OD is

(a) OD > OC (b) OD < OC
(c) OD = OC (d) OD = (1/2)OC

9. If M is the midpoint of hypotenuse Ac of right triangle ABC then BM = $\frac{1}{2}$ ____

(a) AC (b) BC (c) AB (d) none of these

10. In fig. AB = AC and BF = CD. If ΔACD ≅ ΔABE then AD =



(a) AC (b) AE (c) AB
(d) none of these

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

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

23. Prove that the difference between any two sides of a triangle is less than its third side.

24. In an isosceles triangle, prove that the altitude from the vertex bisects the base.

25. Prove that the perpendiculars drawn from the vertices of equal angles of an isosceles triangle to the opposite sides are equal.

26. Prove that the medians of an equilateral triangle are equal.

27. If D is the midpoint of the hypotenuse AC of a right angled triangle ABC, prove that BD = $\frac{1}{2}$ AC.

28. If the bisector of vertical angle of a triangle bisects the base, prove that the triangle is isosceles.

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

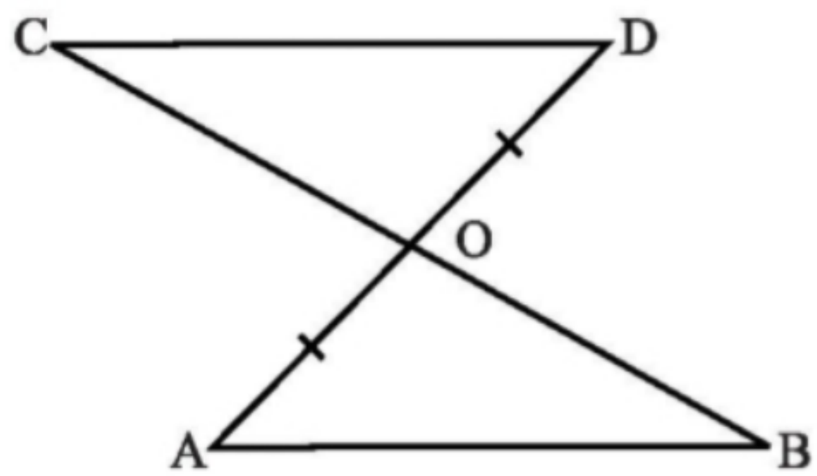
30. Show that the sum of three altitudes of a triangle is less than the sum of the three sides of the triangle.

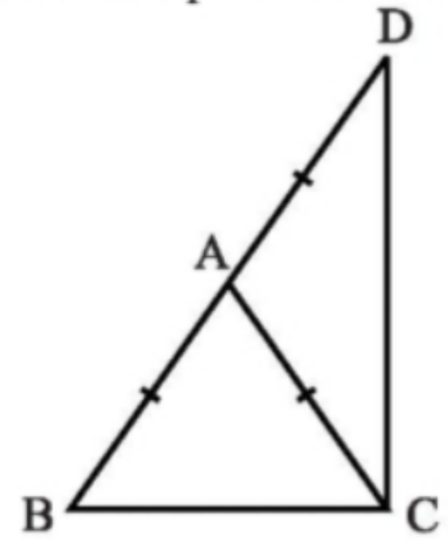
31. Prove that the sum of any two sides of a triangle is greater than twice the median drawn to the third side.

32. Prove that the perimeter of a triangle is greater than the sum of three medians.

33. If O is a point within ΔABC, show that
(i) $AB + AC > OB + OC$
(ii) $AB + BC + CA > OA + OB + OC$.
(iii) $OA + OB + OC > \frac{1}{2}(AB + BC + CA)$

34. Line-segment AB is parallel to another line-segment CD. O is the mid-point of AD (see the adjoining figure). Show that (i) $\Delta AOB \cong \Delta DOC$ (ii) O is also the mid-point of BC.



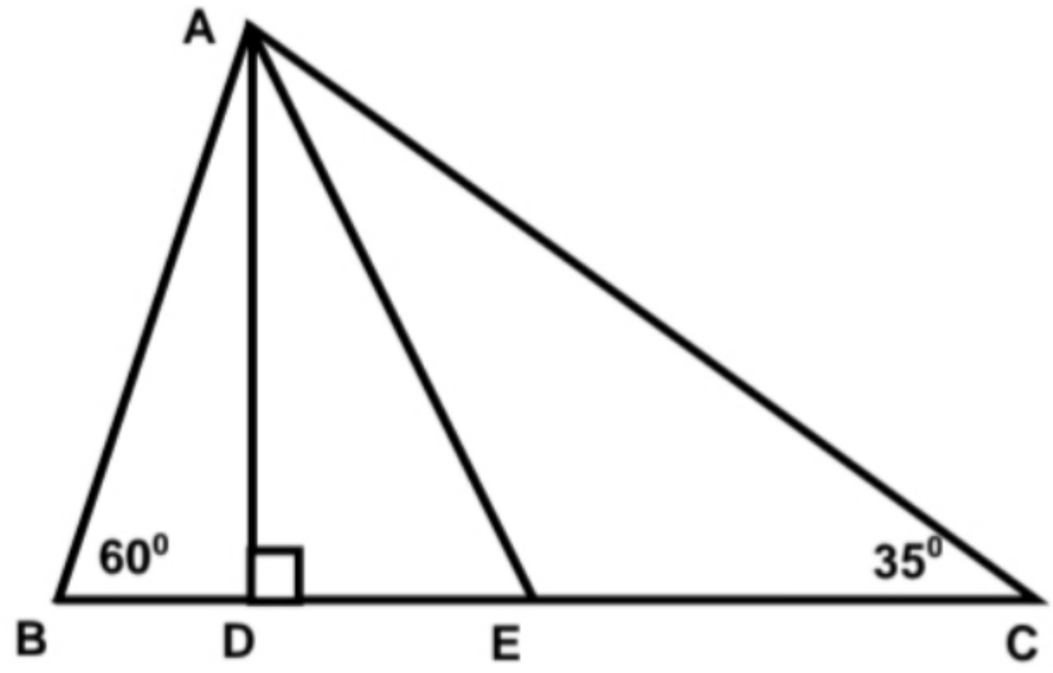


35. ΔABC is an isosceles triangle in which AB = AC. Side BA is produced to D such that AD = AB (see the above right sided figure). Show that $\angle BCD$ is a right angle.

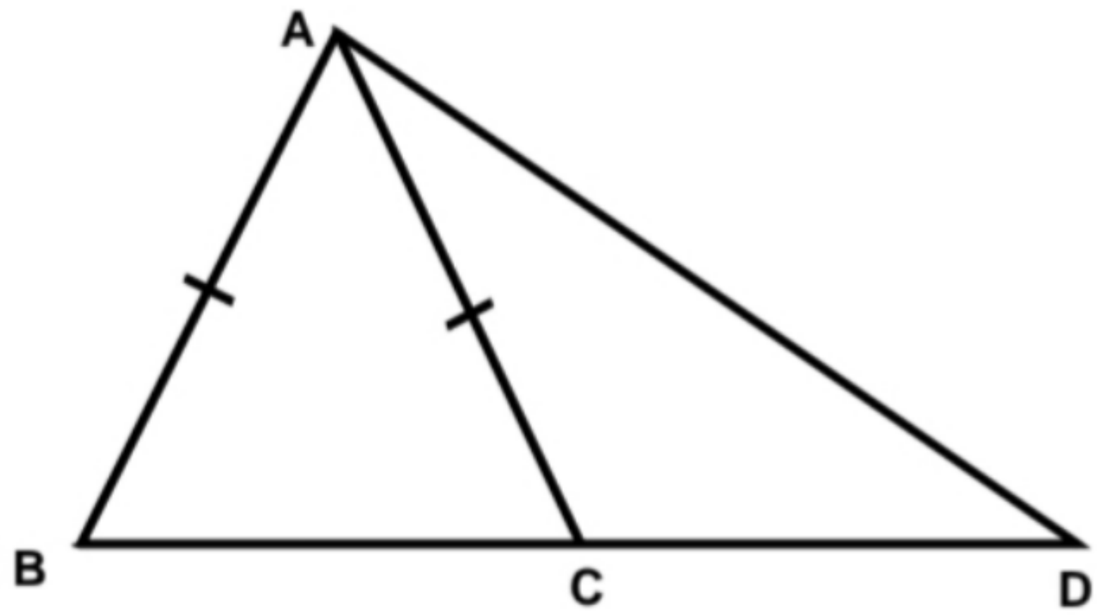
36. D is a point on side BC of ΔABC such that AD = AC. Show that AB > AD.

5. If two isosceles triangles have a common base, prove that the line joining the vertices bisects the base at right angle.

6. In given figure AD ⊥ BC, AE is the angle bisector of ∠BAC. Find ∠DAE



7. In given figure, ABC is a triangle in which AB = AC. If D be a point on BC produced, prove that AD > AC.



13. If two sides of a triangle are unequal, prove that the longer side has the greater angle opposite to it.

14. In a triangle, prove that the greater angle has the longer side opposite to it.

15. Prove that the sum of any two sides of a triangle is greater than its third side.

16. If in two right triangles, hypotenuse and one side of a triangle are equal to the hypotenuse and one side of other triangle, prove that the two triangles are congruent

17. Prove that "Angles opposite to equal sides of a triangle are equal".

18. Prove that "If two angles and the included side of one triangle are equal to two angles and the included side of the other triangle, then the two triangles are congruent".

19. Prove that "If two angles and one side of one triangle are equal to two angles and the corresponding side of the other triangle, then the two triangles are congruent"

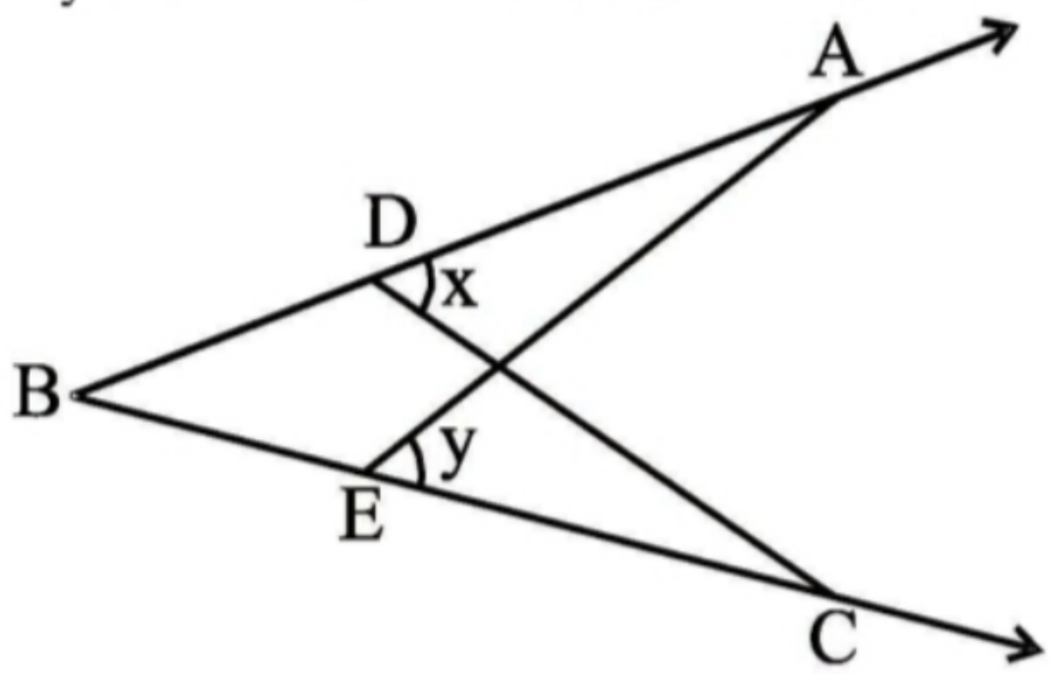
20. Prove that "If three sides of one triangle are equal to three sides of the other triangle, then the two triangles are congruent".

PRACTICE QUESTIONS

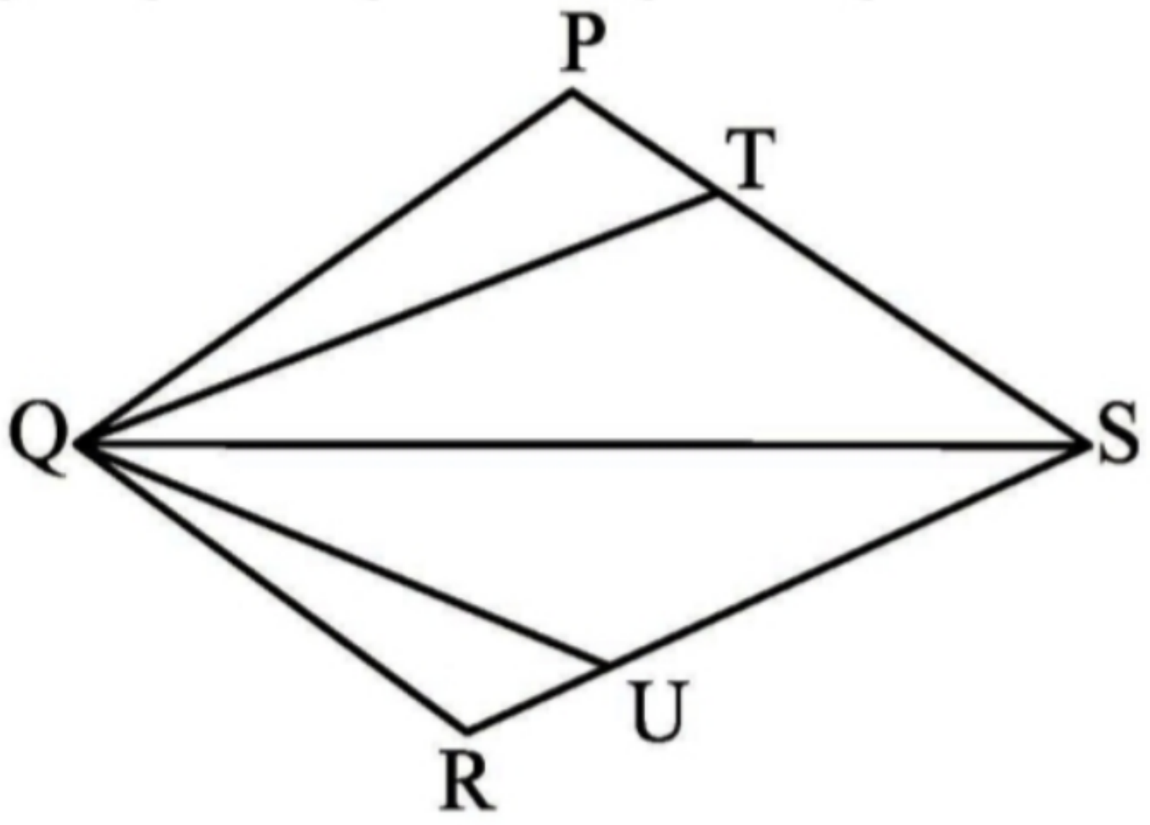
CLASS IX: CHAPTER - 7

TRIANGLES

1. In the figure if $\angle x = \angle y$ and AB = CB. Prove that AE = CD.

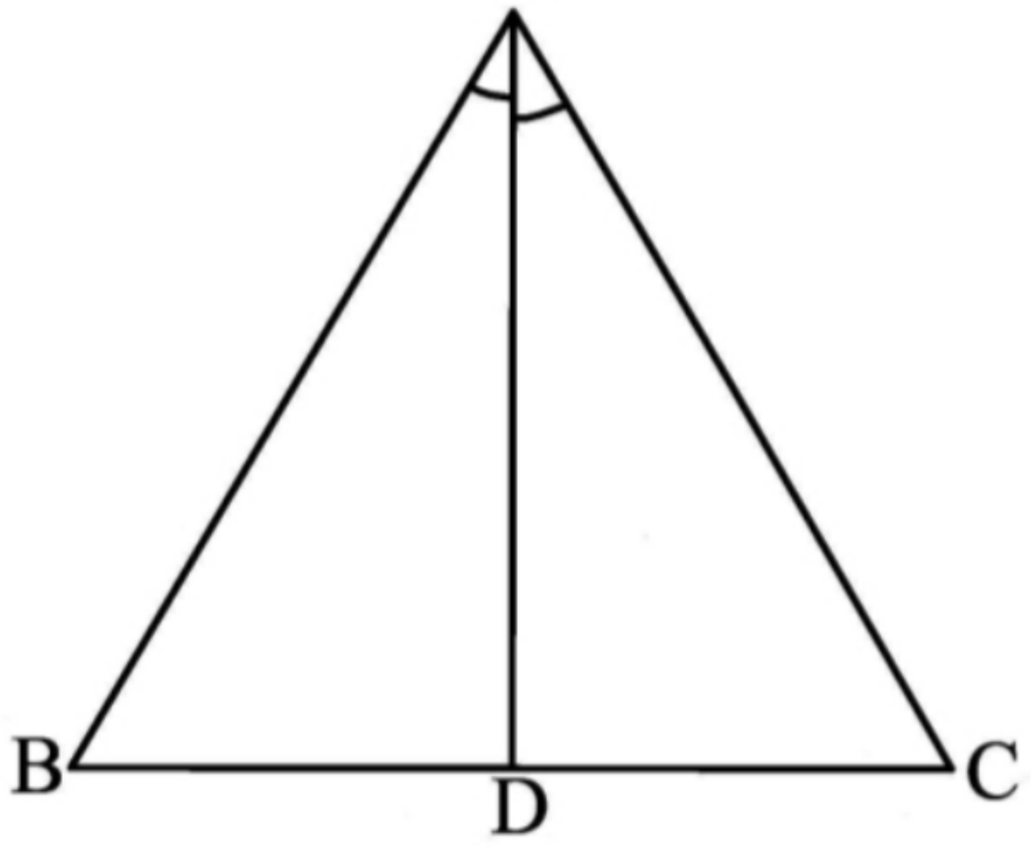


2. In the figure PQRS is a quadrilateral and T and U are respectively points on PS and RS such that PQ = RQ, $\angle PQT = \angle RQU$ and $\angle TQS = \angle UQS$. Prove that QT = QU.



3. ABC is a triangle in which $\angle B = 2\angle C$. D is a point on BC such that AD bisects $\angle BAC$ and AB = CD. Prove that $\angle BAC = 72^0$.

4. In figure if AD is the bisector of $\angle A$, show that: (i) AB > BD (ii) AC > CD.

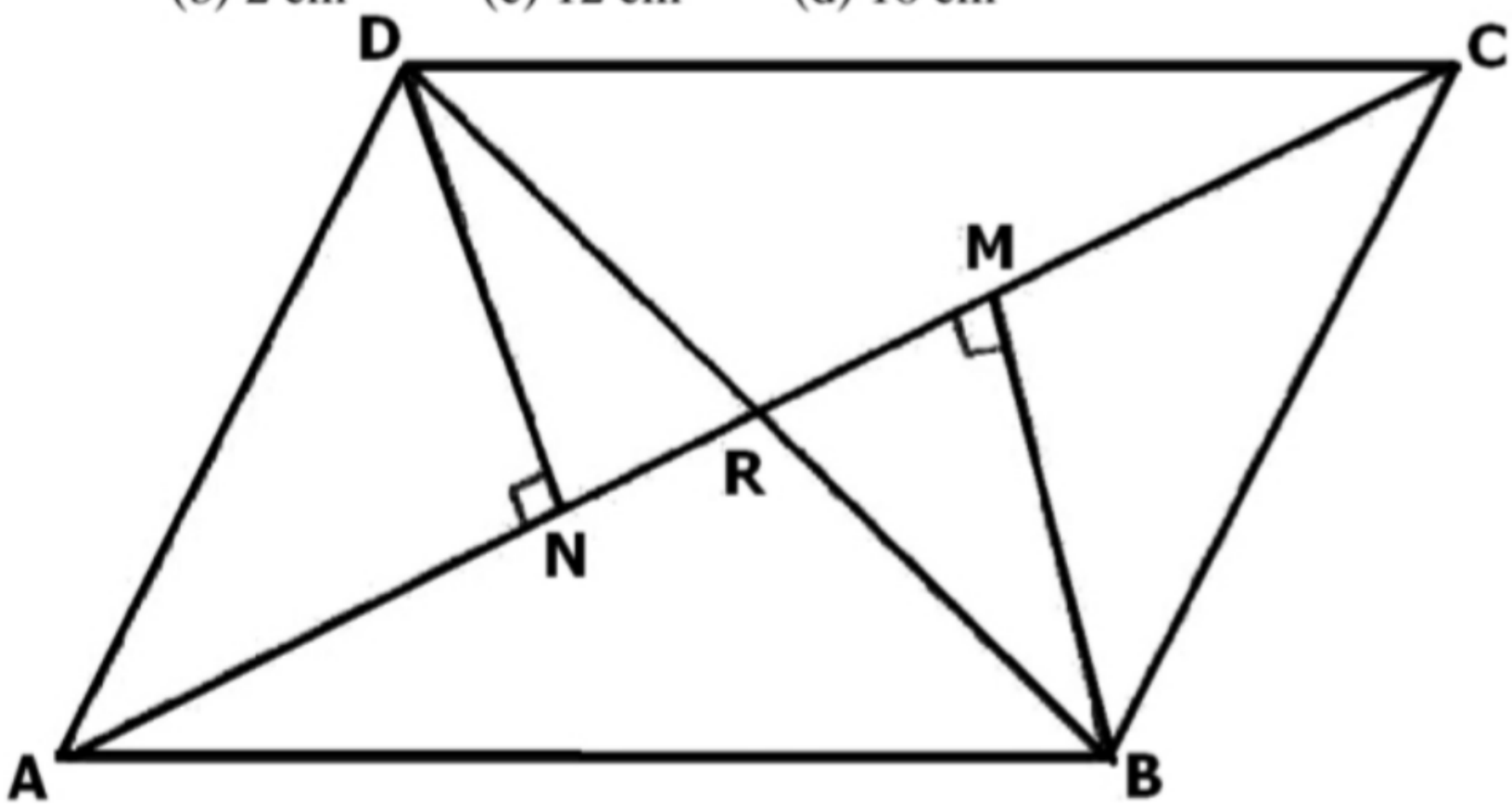


5. If the bisector of vertical angle of a triangle is perpendicular to the base of triangle is
(a) an Equilateral triangle (b) a scalene triangle
(c) an obtuse angled triangle (d) an acute angled triangle .

6. In a ΔABC and ΔPQR, three equality relations between same parts are as follows:
$AB = QP$, $\angle B = \angle P$ and $BC = PR$
State which of the congruence conditions applies:
(a) SAS (b) ASA (c) SSS (d) RHS

7. D, E , F are the midpoints of the sides BC, CA and AB respectively of ΔABC, then ΔDEF is congruent to triangle
(a) ABC (b) AEF
(c) BFD, CDE (d) AFE, BFD, CDE

8. In quadrilateral ABCD, BM and DN are drawn perpendicular to AC such that BM = DN. If BR = 8 cm, then BD is
(a) 4 cm (b) 2 cm (c) 12 cm (d) 16 cm



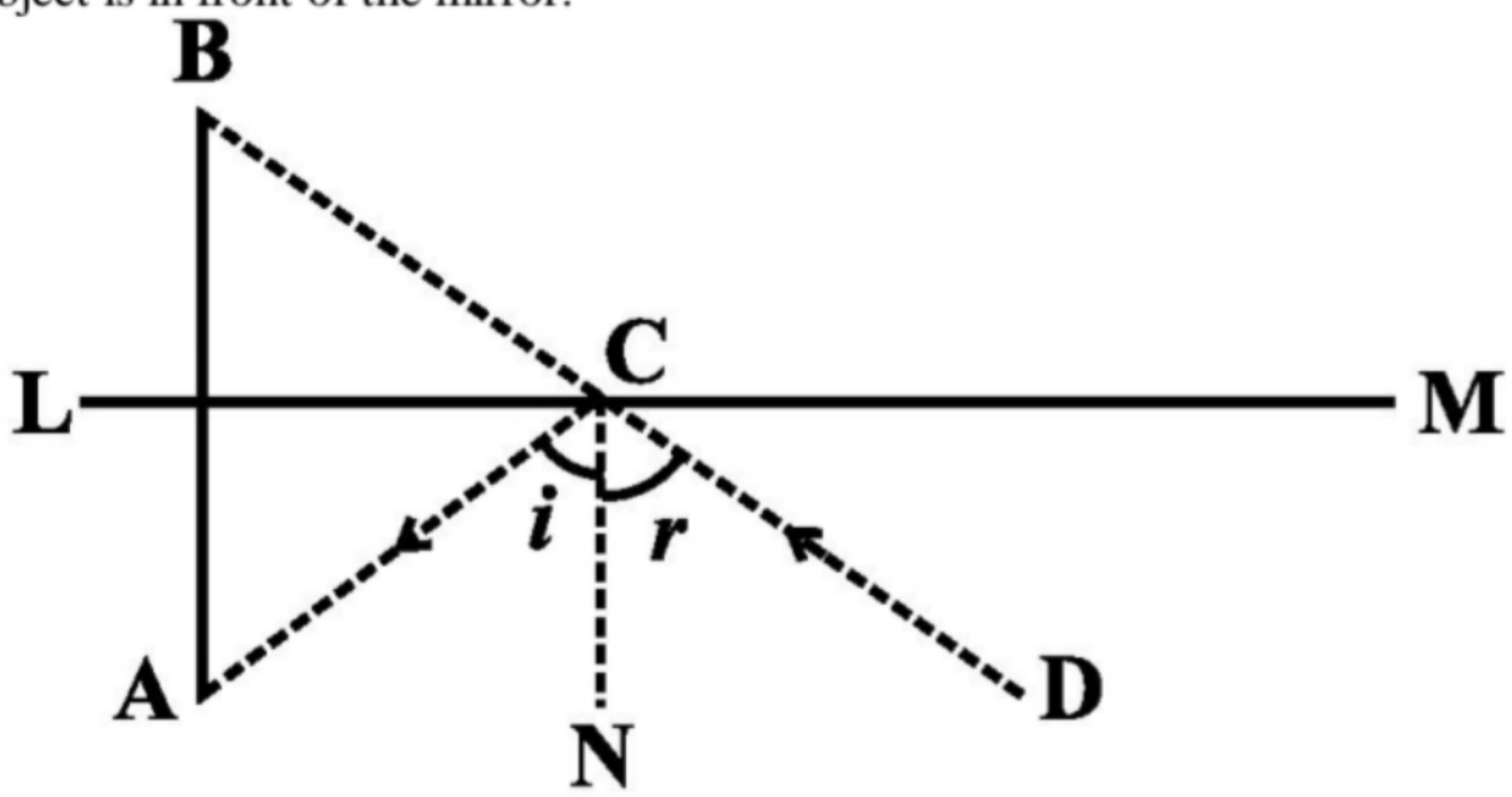
9. If $\Delta ABC \cong \Delta PQR$ and ΔABC is not congruent to ΔRPQ, then which of the following is not true:
(a) BC = PQ (b) AC = PR (c) QR = BC (d) AB = PQ

10. D is a point on the side BC of a $\angle ABC$ such that AD bisects ΔBAC. Then
(a) BD = CD (b) BA > BD (c) BD > BA (d) CD > CA

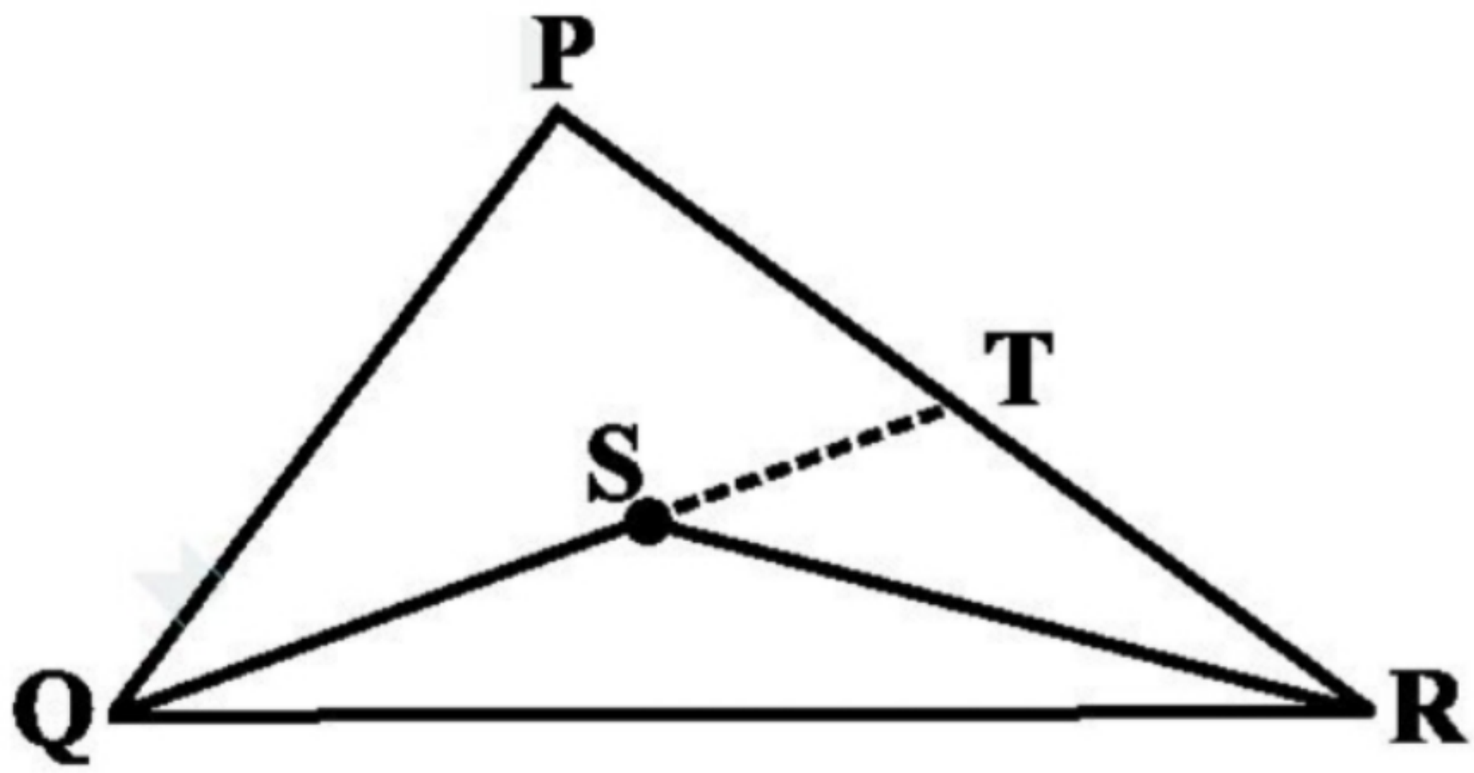
.....

68. In a right triangle, prove that the line-segment joining the mid-point of the hypotenuse to the opposite vertex is half the hypotenuse.

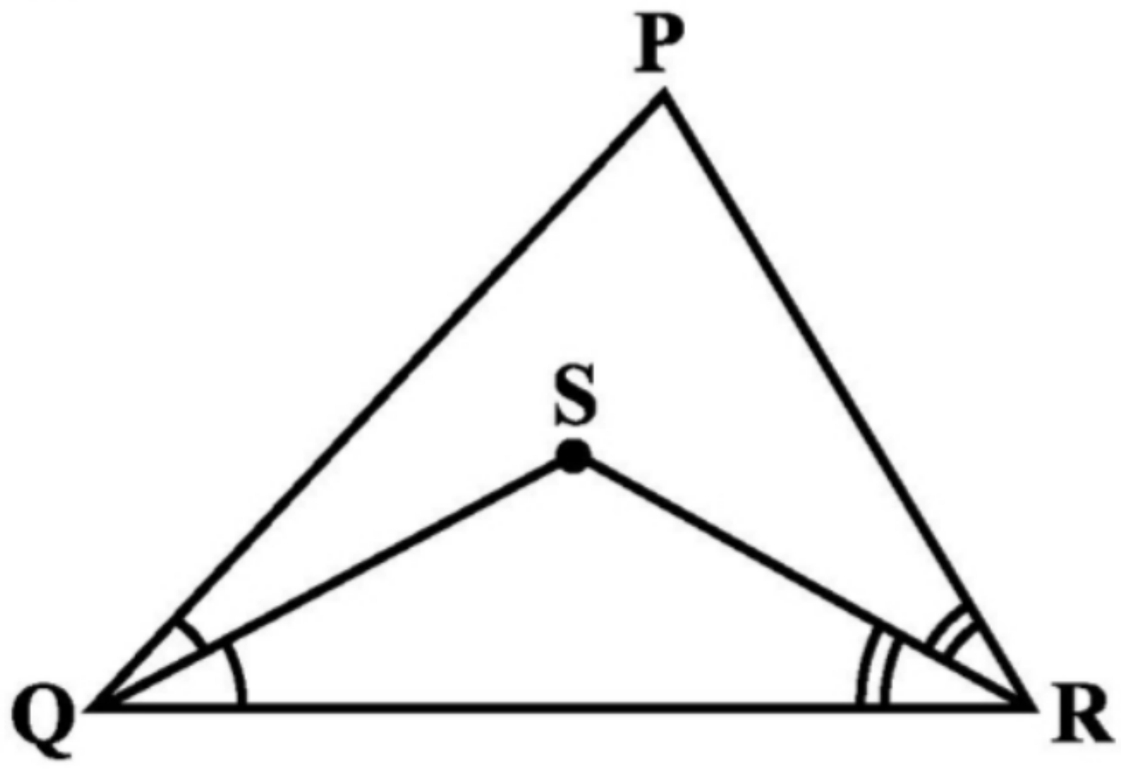
69. The image of an object placed at a point A before a plane mirror LM is seen at the point B by an observer at D as shown in below Fig.. Prove that the image is as far behind the mirror as the object is in front of the mirror.



70. S is any point in the interior of ΔPQR. Show that SQ + SR < PQ + PR.



54. In the below Figure, PQ > PR and QS and RS are the bisectors of ∠Q and ∠R, respectively. Show that SQ > SR.



55. ABCD is quadrilateral such that AB = AD and CB = CD. Prove that AC is the perpendicular bisector of BD.

56. Two lines *l* and *m* intersect at the point O and P is a point on a line *n* passing through the point O such that P is equidistant from *l* and *m*. Prove that *n* is the bisector of the angle formed by *l* and *m*.

57. Line segment joining the mid-points M and N of parallel sides AB and DC, respectively of a trapezium ABCD is perpendicular to both the sides AB and DC. Prove that AD = BC.

58. ABCD is a quadrilateral such that diagonal AC bisects the angles A and C. Prove that AB = AD and CB = CD.

59. ABC is a right triangle such that AB = AC and bisector of angle C intersects the side AB at D. Prove that AC + AD = BC.

60. P is a point on the bisector of ∠ABC. If the line through P, parallel to BA meet BC at Q, prove that BPQ is an isosceles triangle.

61. ABCD is a quadrilateral in which AB = BC and AD = CD. Show that BD bisects both the angles ABC and ADC.

62. ABC is a right triangle with AB = AC. Bisector of □∨A meets BC at D. Prove that BC = 2 AD.

63. O is a point in the interior of a square ABCD such that OAB is an equilateral triangle. Show that ΔOCD is an isosceles triangle.

64. ABC and DBC are two triangles on the same base BC such that A and D lie on the opposite sides of BC, AB = AC and DB = DC. Show that AD is the perpendicular bisector of BC.

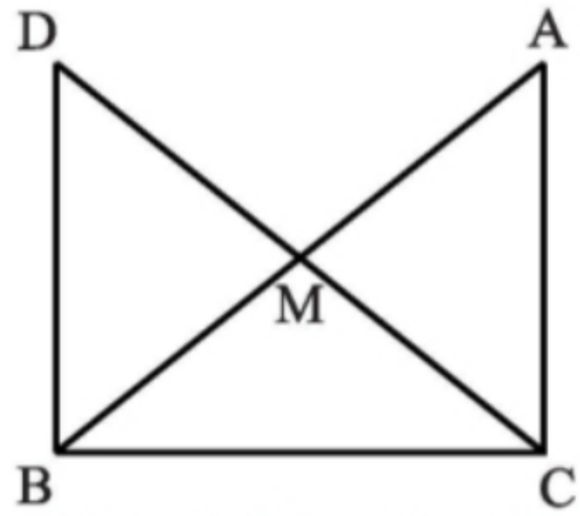
65. ABC is an isosceles triangle in which AC = BC. AD and BE are respectively two altitudes to sides BC and AC. Prove that AE = BD.

66. Prove that sum of any two sides of a triangle is greater than twice the median with respect to the third side.

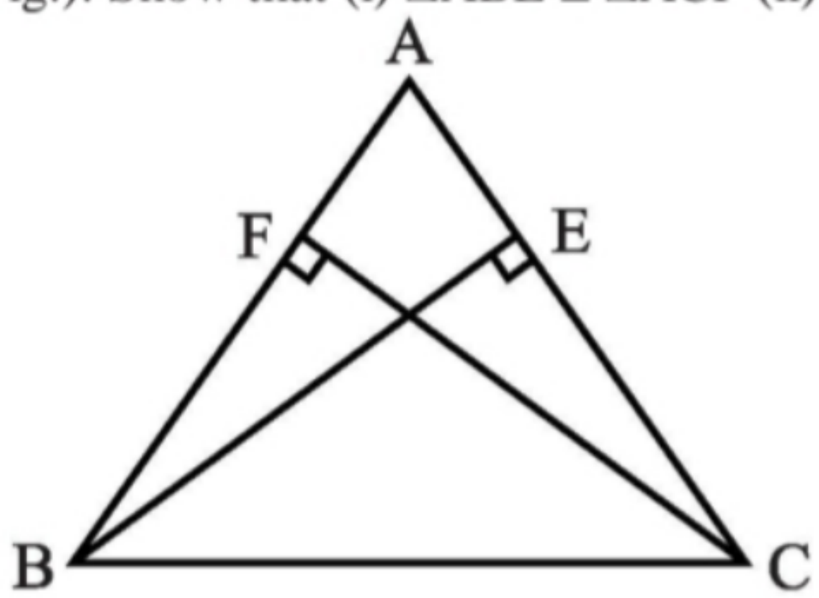
67. Show that in a quadrilateral ABCD, AB + BC + CD + DA < 2 (BD + AC).

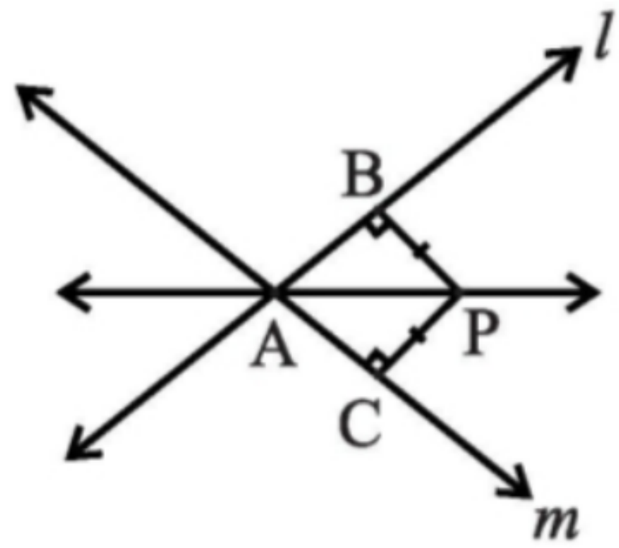
47. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B (see the above side figure). Show that:

(i) $\Delta AMC \cong \Delta BMD$ (ii) $\angle DBC$ is a right angle. (iii) $\Delta DBC \cong \Delta ACB$ (iv) $CM = \frac{1}{2} AB$



48. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal (see the below Fig.). Show that (i) $\Delta ABE \cong \Delta ACF$ (ii) AB = AC, i.e., ABC is an isosceles triangle.

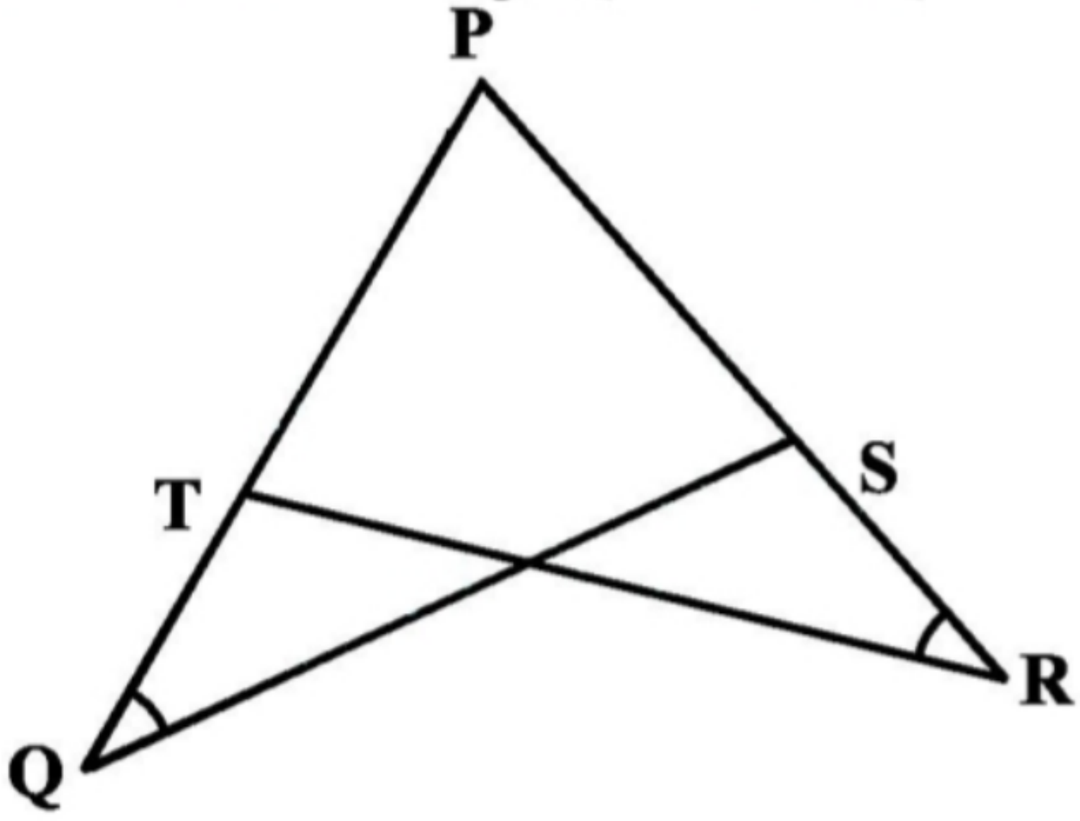


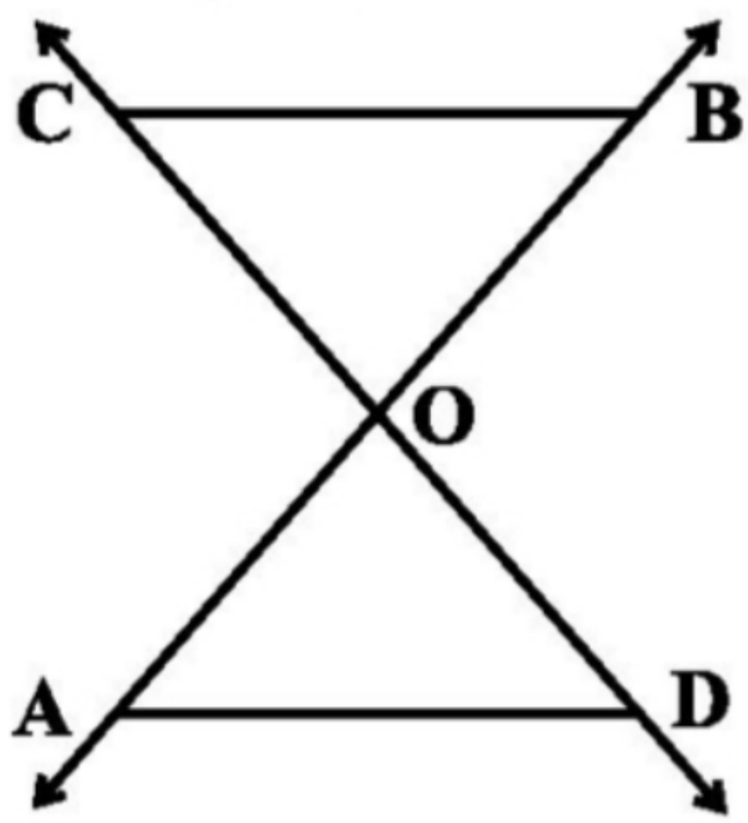


49. P is a point equidistant from two lines *l* and *m* intersecting at point A (see the above right side figure). Show that the line AP bisects the angle between them.

50. The angles of triangle are $(x + 10^0)$, $(2x - 30^0)$ and x^0. Find the value of x.

51. In the below Fig, PQ = PR and $\angle Q = \angle R$. Prove that $\Delta PQS \cong \Delta PRT$.





52. In the above right sided Figure, two lines AB and CD intersect each other at the point O such that BC || DA and BC = DA. Show that O is the midpoint of both the line-segments AB and CD.

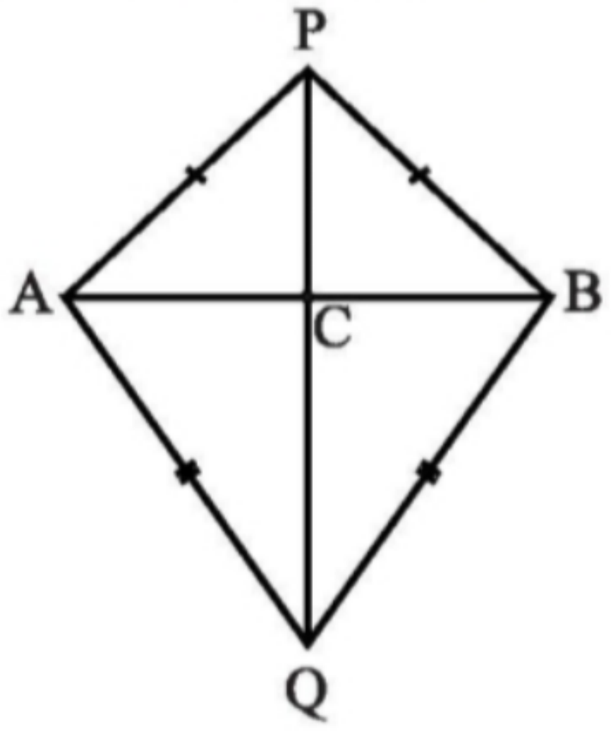
53. ABC is an isosceles triangle with AB = AC and BD and CE are its two medians. Show that BD = CE.

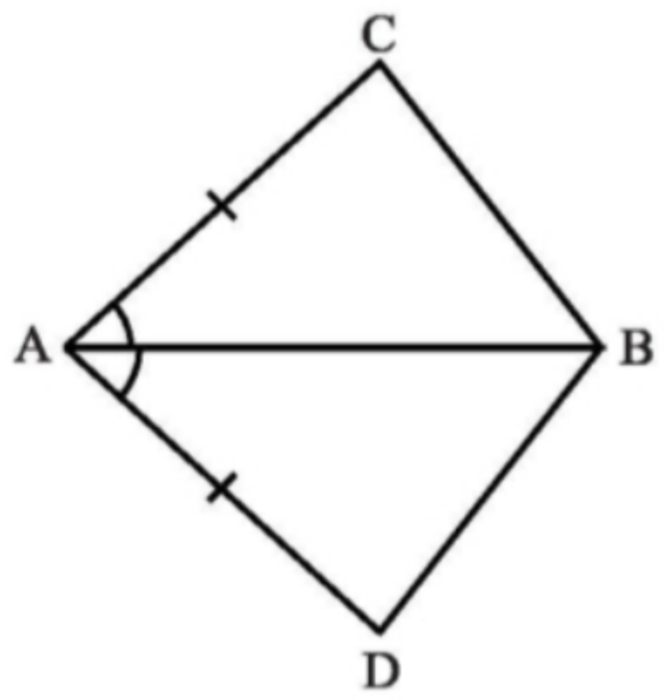
37. AD is an altitude of an isosceles triangle ABC in which AB = AC. Show that (i) AD bisects BC (ii) AD bisects ∠A.

38. AB is a line segment and line *l* is its perpendicular bisector. If a point P lies on *l*, show that P is equidistant from A and B.

39. ABC is a right angled triangle in which ∠A = 90° and AB = AC. Find ∠B and ∠C.

40. AB is a line-segment. P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B(see in the below left figure). Show that the line PQ is the perpendicular bisector of AB.

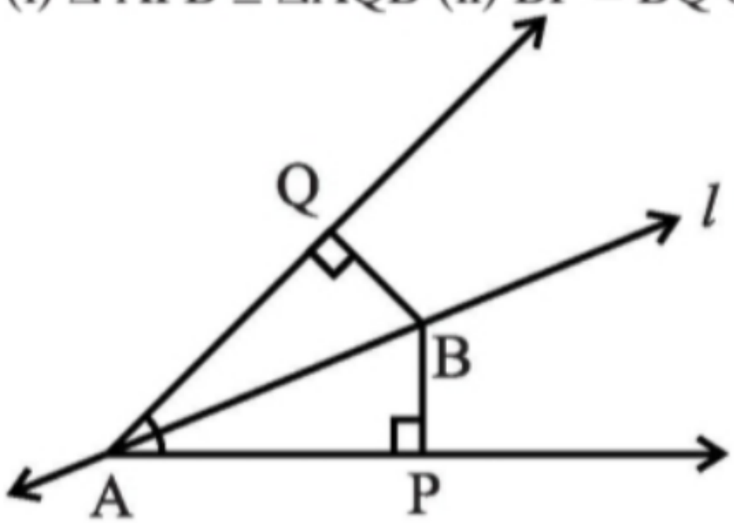


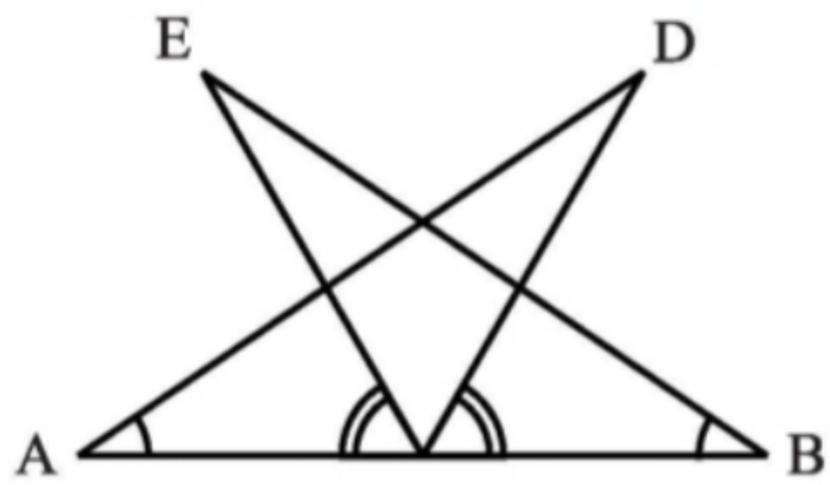


41. In quadrilateral ACBD, AC = AD and AB bisects ∠A (see the above right sided Fig.). Show that Δ ABC≅Δ ABD. What can you say about BC and BD?

42. In an isosceles triangle ABC, with AB = AC, the bisectors of ∠ B and ∠C intersect each other at O. Join A to O. Show that : (i) OB = OC (ii) AO bisects ∠A

43. Line *l* is the bisector of an angle ∠A and B is any point on *l*. BP and BQ are perpendiculars from B to the arms of ∠A (see the above side figure). Show that:
(i) Δ APB ≅ ΔAQB (ii) BP = BQ or B is equidistant from the arms of ∠A.





44. 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 the above right sided figure). Show that (i) ΔDAP ≅ ΔEBP (ii) AD = BE

45. BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles.

46. ABC is an isosceles triangle with AB = AC. Draw AP □⇔ BC to show that ∠B = ∠C.