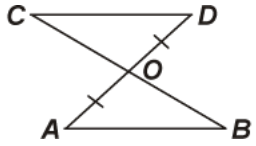
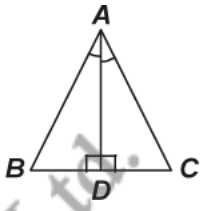
Date: 25/9/2021

Q1. 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.

Q2. Line-segment AB is parallel to another line-segment CD. O is the mid-point of AD (see figure). Show that (i) $\Delta AOB \cong \Delta DOC$ (ii) O is also the mid-point of BC.



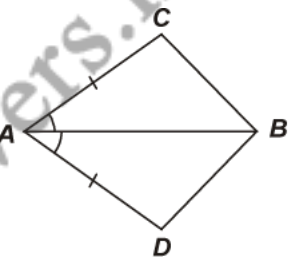
Q3. In ΔABC, the bisector AD of $\angle A$ is perpendicular to side BC (see figure). Show that $AB = AC$ and ΔABC is isosceles.



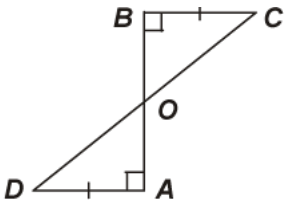
Q4. E and F are respectively the mid-points of equal sides AB and AC of ΔABC (see figure). Show that $BF = CE$.

Q5. D is a point on side BC of ΔABC such that $AD = AC$ (see figure). Show that $AB > AD$.

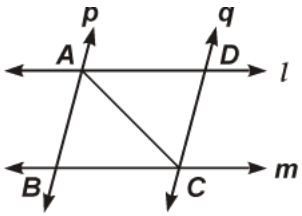
Q6. In quadrilateral $ACBD$, $AC = AD$ and AB bisects $\angle A$ (see figure). Show that $\Delta ABC \cong \Delta ABD$. What can you say about BC and BD?



Q7. AD and BC are equal perpendiculars to a line segment AB (see figure). Show that CD bisects AB.



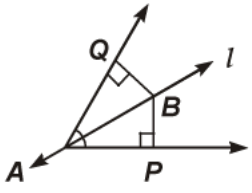
Q8. l and m are two parallel lines intersected by another pair of parallel lines p and q (see figure). Show that $\Delta ABC \cong \Delta CDA$.



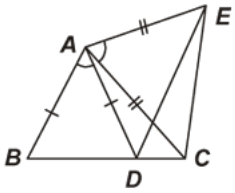
Q9. Line l is the bisector of an angle $\angle A$ and B is any point on l. BP and BQ are perpendiculars from B to the arms of $\angle A$ (see figure). Show that

(i) $\Delta APB \cong \Delta AQB$.

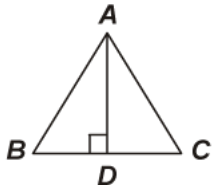
(ii) $BP = BQ$ or B is equidistant from the arms of $\angle A$.



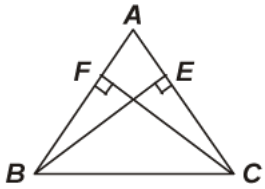
Q10. In figure, $AC = AE$, $AB = AD$ and $\angle BAD = \angle EAC$. Show that $BC = DE$.



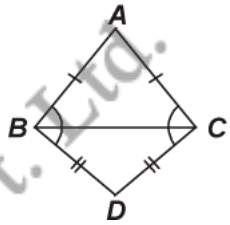
Q11. In ΔABC, AD is the perpendicular bisector of BC (see figure). Show that ΔABC is an isosceles triangle in which $AB = AC$.



Q12. ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively (see figue). Show that these altitudes are equal.



Q13. ABC and DBC are two isosceles triangles on the same base BC (see figure). Show that $\angle ABD = \angle ACD$.



Q14. ABC is a right angled triangle in which $\angle A = 90°$ and $AB = AC$. Find $\angle B$ and $\angle C$.

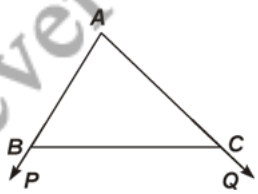
Q15. Show that the angles of an equilateral triangle are $60°$ each.

Q16. AD is an altitude of an isosceles triangle ABC in which $AB = AC$. Show that

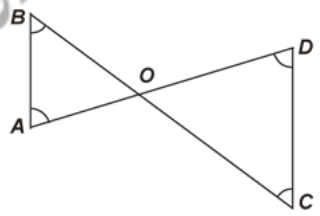
(i) AD bisects BC (ii) AD bisects $\angle A$.

Q17. Show that in a right angled triangle, the hypotenuse is the longest side.

Q18. In the figure, sides AB and AC of ΔABC are extended to points P and Q respectively. Also, $ABC < QCB$. Show that $AC > AB$.



Q19. In the figure, $\angle B < \angle A$ and $\angle C < \angle D$. Show that $AD < BC$.



Q20. Show that of all line segments drawn from a given point not on it, the perpendicular line segment is the shortest.

Q21. ABC is a triangle. Locate a point in the interior of ΔABC which is equidistant from all the vertices of ABC.

Q22. In a triangle locate a point in its interior which is equidistant from all the sides of the triangle.

Q23. In a huge park, people are concentrated at three points (see figure).

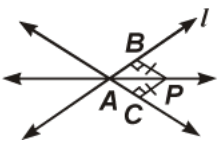
A: where there are different slides and swings for children.

B: near which a man-made lake is situated,

C: which is near to a large parking and exit.

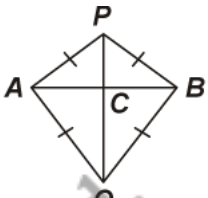
Where should an icecream parlour be set up so that maximum number of persons can approach it?

[Hint: The parlour should be equidistant from A, B and C)

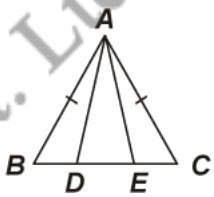


Q24. P is a point equidistant from two lines l and m intersecting at point A (see figure). Show that the line AP bisects the angle between them.

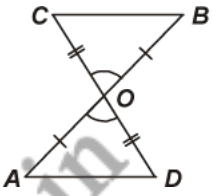
Q25. AB is a line-segment. P and Q are points on opposite sides of AB such that each of them is equidistant from the points A and B. Show that the line PQ if the perpendicular bisector of AB.



Q26. In an isosceles triangle ABC with $AB = AC$, D and E are points on BC such that $BE = CD$ (see figure). Show that $AD = AE$.



Q27. In figure, $OA = OB$ and $OD = OC$. Show that (i) $\Delta AOD \cong \Delta BOC$ and (ii) $AD \parallel BC$.

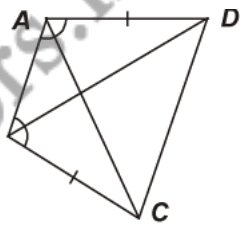


Q28. $ABCD$ is a quadrilateral in which $AD = BC$ and $\angle DAB = \angle CBA$ (see figure). Prove that

(i) $\Delta ABD \cong \Delta BAC$

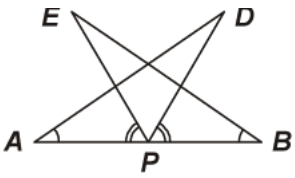
(ii) $BD = AC$

(iii) $\angle ABD = \angle BAC$.



Q29. AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (see figure). Show that

(ii) $\Delta DAP \cong \Delta EBP$ (ii) $AD = BE$



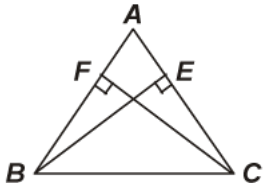
Q30. In an isosceles triangle ABC, with $AB = AC$, the bisectors of $\angle B$ and $\angle C$ intersect each other at O. Join A to O. Show that:

(i) $OB = OC$ (ii) AO bisects $\angle A$.

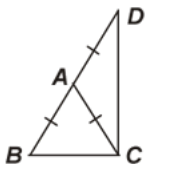
Q31. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal (see figure). Show that

(i) $\Delta ABE \cong \Delta ACF$.

(ii) $AB = AC$, *i.e.*, ABC is an isosceles triangle.

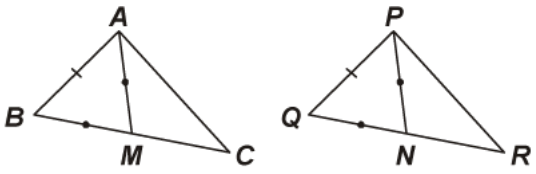


Q32. ΔABC is an isosceles triangle in which $AB = AC$. Side BA is produced to D such that $AD = AB$ (see figure). Show that $\angle BCD$ is a right angle.



Q33. 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 (see figure). Show that:

(i) $\Delta ABM \cong \Delta PQN$ (ii) $\Delta ABC \cong \Delta PQR$.

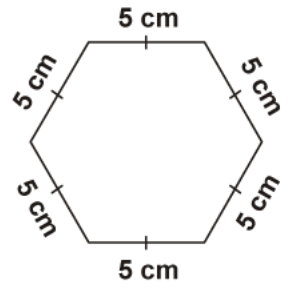


Q34. BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles.

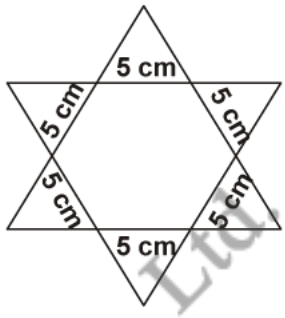
Q35. ABC is an isosceles triangle with $AB = AC$. Draw $AP \perp BC$ to show that $\angle B = \angle C$.

Q36. Complete the hexagonal and star shaped Rangolies [see figure (a) and (b)] by filling them with as many equilateral triangles of side 1 cm as you can. Count the number of triangles in each case. Which has more triangles?

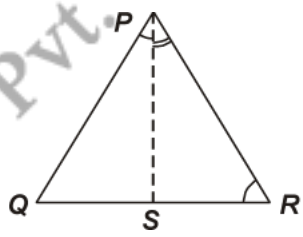
(a)



(b)



Q37. In the figure, $PR > PQ$ and PS bisects $\angle QPR$. Prove that $\angle PSR > \angle PSQ$.

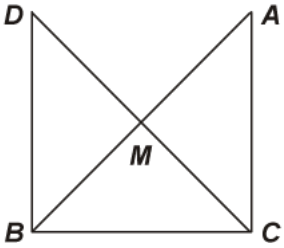


Q38. AB and CD are respectively the smallest and longest sides of a quadrilateral $ABCD$ (see figure). Show that $\angle A > \angle C$ and $\angle B > \angle D$.

Q39. 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 figure). Show that:

(i) $\Delta AMC \cong \Delta BMD$ (ii) $\angle DBC$ is right angle

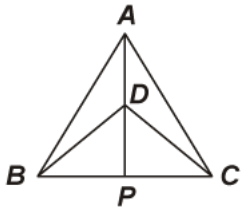
(iii) $\Delta DBC \cong \Delta ACB$ (iv) $CM = \frac{1}{2} AB$



Q40. 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, show that

(i) $\Delta ABD \cong \Delta ACD$ (ii) $\Delta ABP \cong \Delta ACP$

(iii) AP bisects $\angle A$ as well as $\angle D$ (iv) AP is the perpendicular bisector of BC.



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S1. Proved.

S2. Proved.

S3. Proved.

S4. Proved.

S5. Proved.

S6. They are equal.

S7. Proved.

S8. Proved.

S9. Proved.

S10. $\angle BAC = \angle DAE$.

S11. Proved.

S12. Proved.

S13. Proved.

S14. Each is of 45°.

S15. Proved.

S16. Proved.

S17. Proved.

S18. Proved.

S19. Proved.

S20. Proved.

S21. Try yourself.

S22. Try yourself.

S23. Try yourself.

S24. Proved.

S25. Proved.

S26. Proved.

S27. (i) Proved. (ii) Proved.

S28. Proved.

S29. Proved.

S30. Proved.

S31. Proved.

S32. $\angle BCD = \angle BCA + \angle DCA = \angle B + \angle D$.

S33. (i) **Prove.** (ii) **Prove.**

S34. Proved.

S35. Proved.

S36. Try yourself.

S37. $\angle Q + \angle QPS > \angle R + \angle RPS$, etc.

S38. Join BD and show $\angle B > \angle D$. Join AC and show $\angle A > \angle C$.

S39. Proved.

S40. Proved.