doubtnut
India's Number 1 Education App

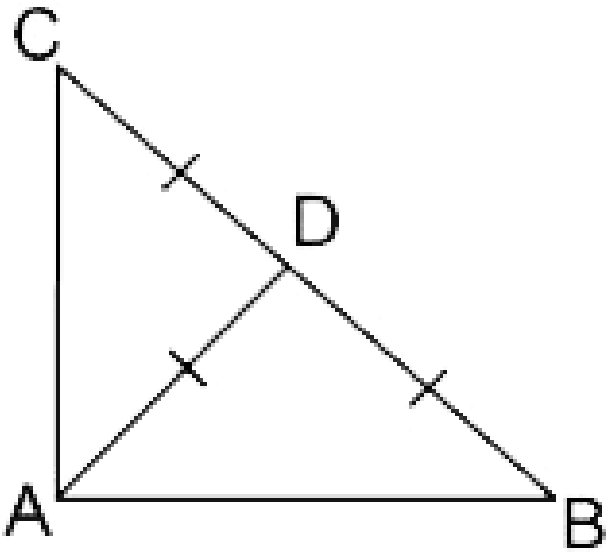
MATHS

BOOKS - MTG IIT JEE FOUNDATION

TRIANGLES

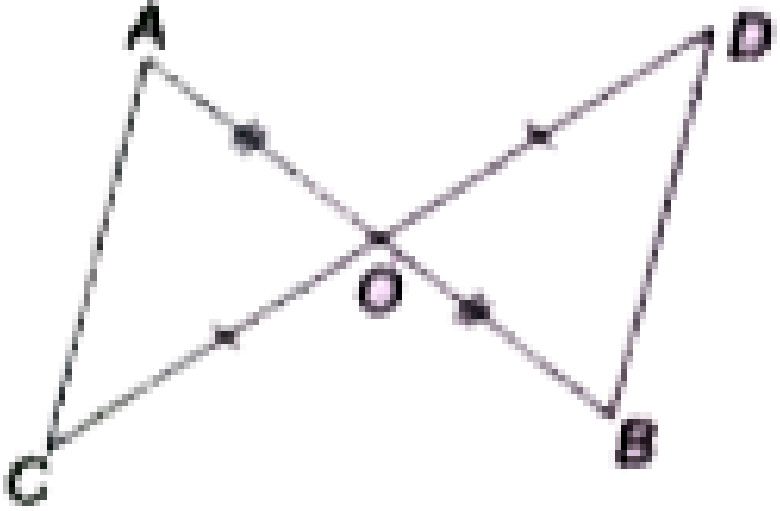
Illustrations

1. Prove that $\Delta ABD \cong \Delta ACD$ given that $BD = CD = 5cm, \angle ADB = \angle ADC$



Watch Video Solution

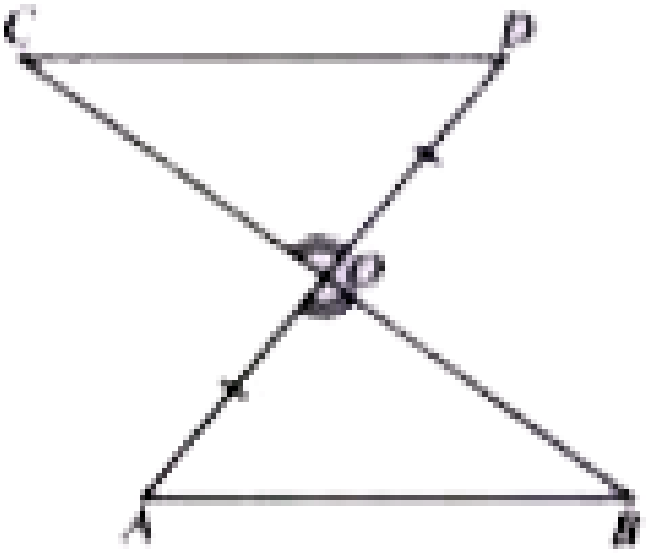
2. In Figure O is the mid-point of aB and CD. Prove tat AC=BD and AC||BD.



Watch Video Solution

3. In the figure AB || CD, AD and BC intersect at o and O is mid-point of AD. Show that

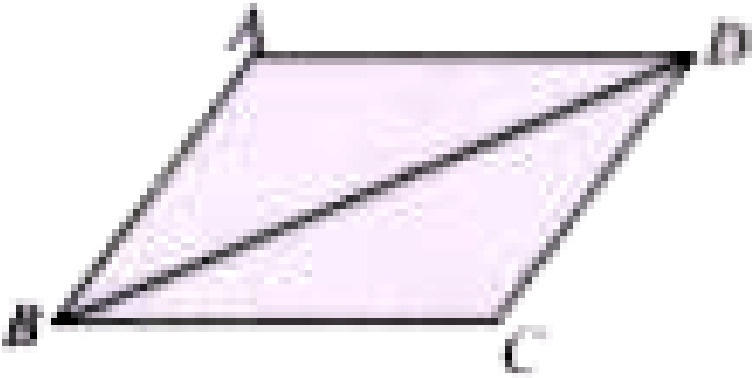
(i) $\Delta AOB \cong \Delta DOC$ and $(ii) OB = OC.$



Watch Video Solution

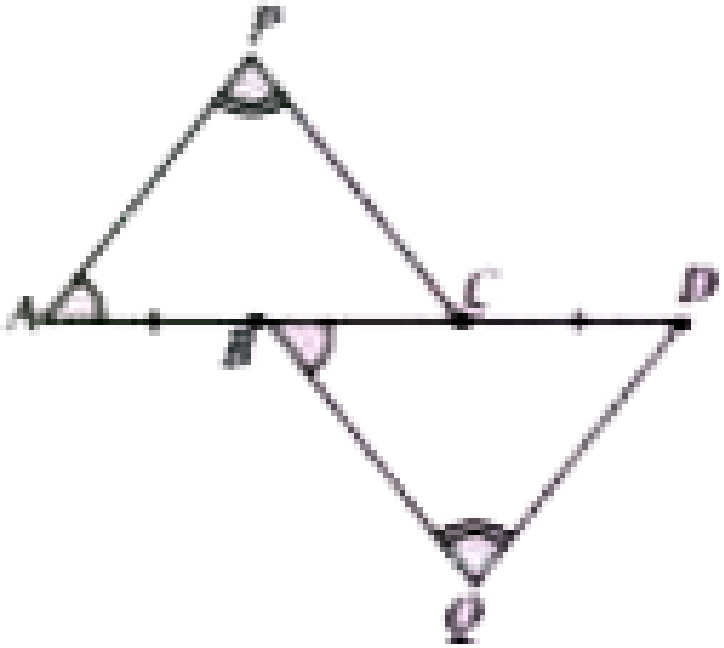
4. In quadrilateral ABCD, AB||CD and BC||AD. Show that

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



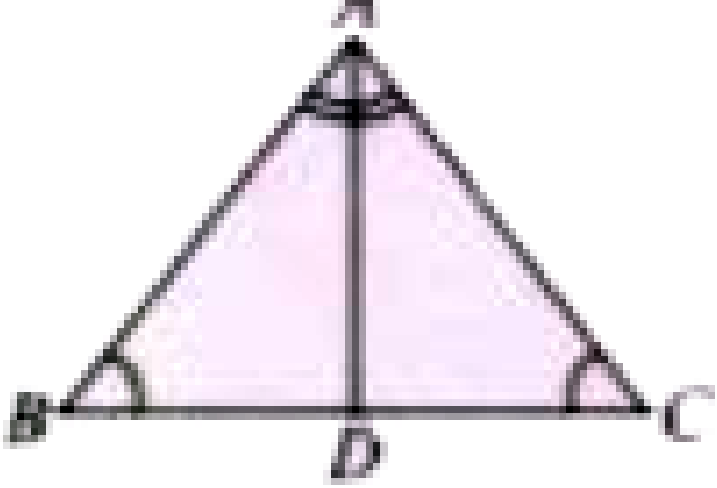
Watch Video Solution

5. In figure $AB = CD, \angle PAC = \angle QBD,$ Prove that $\Delta APC \cong \Delta BQD$



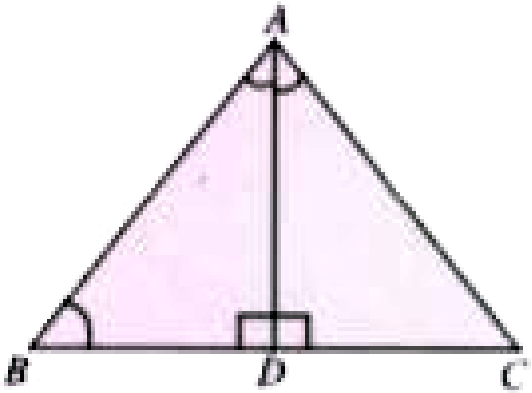
Watch Video Solution

6. In figure $\angle ABD = \angle ACD$, AD is bisectyor of $\angle BAC$ and AD meets BC at D. Prove that D is mid-point of BC.



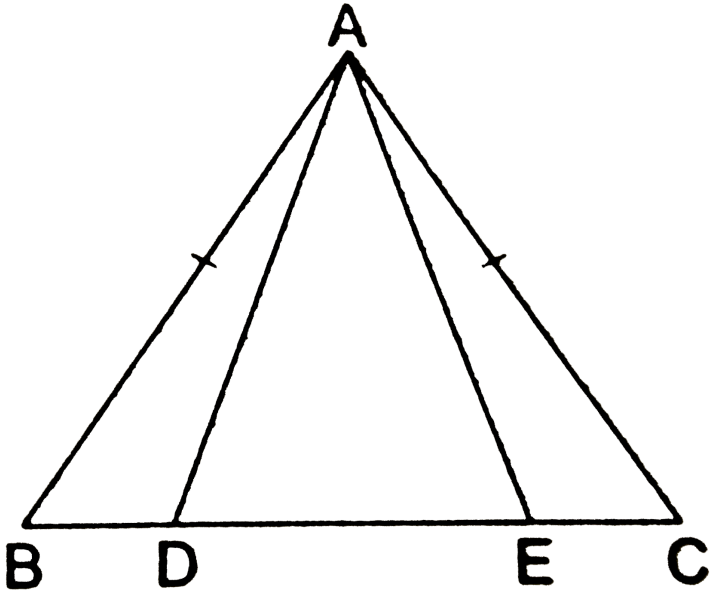
Watch Video Solution

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



Watch Video Solution

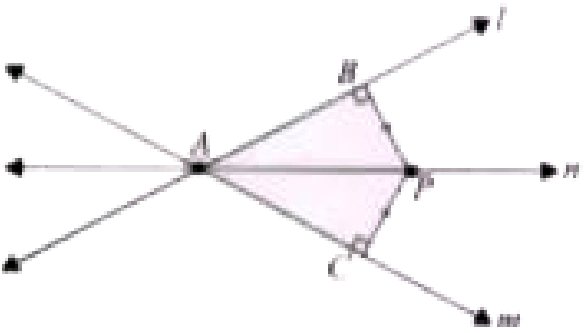
8. In an isosceles ΔABC with AB = AC, D and E are point on BC such that BE = CD. Show that AD = AE.



Watch Video Solution

9. In figure P is a point equidistant from the lines l and m intersecting at point A. Show that the line n (along AP) bisects

the angle between l and m.



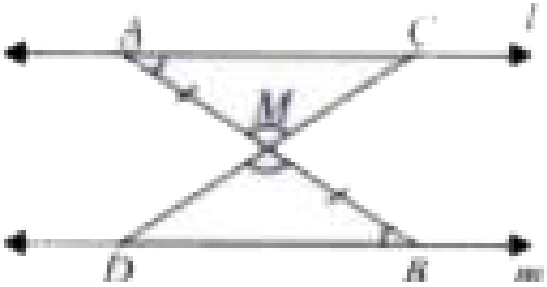
Watch Video Solution

Solved Examples

1. Prove that ΔABC is isosceles if median AD is perpendicular to BC.

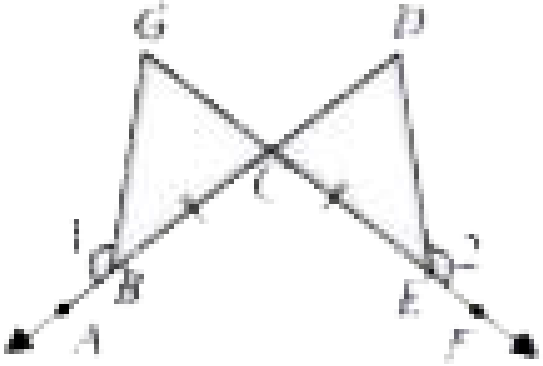
Watch Video Solution

2. In figure l||m and M is the mid-point of the line segment AB. Prove that M is also the mid-point of line segment CD.



Watch Video Solution

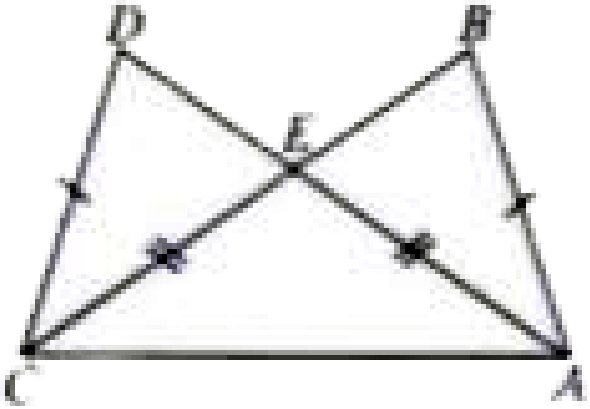
3. In figure it is given that $BC = CE$ and $\angle 1 = \angle 2$. Prove that $\Delta GCB \cong \Delta DCE$.



Watch Video Solution

Watch Video Solution

4. In the figure it is given that AB=CD and AD=BC. Prove that $\Delta ABC \cong \Delta CDA$.



Watch Video Solution

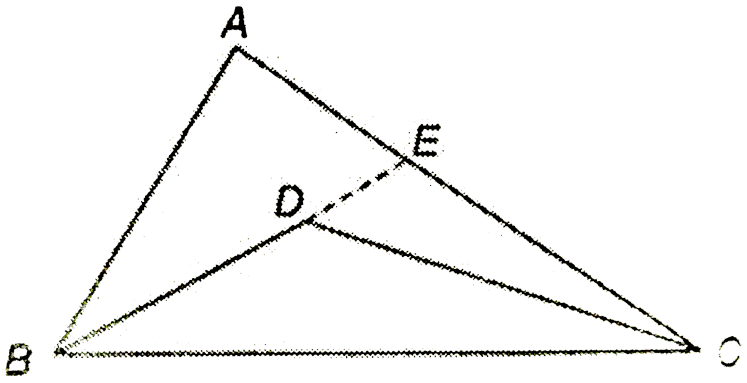
5. $ABCD$ is a parallelogram, if the two diagonals are equal, find the measure of $\angle ABC$.

Watch Video Solution

6. $AD,\ BE\ and\ CF,$ the altitudes of ABC are equal. Prove that ABC is an equilateral triangle.

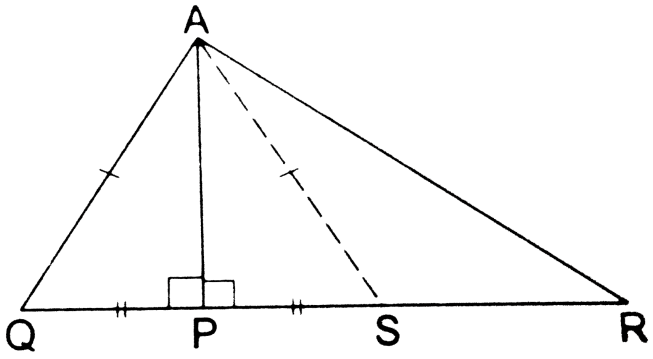
Watch Video Solution

7. In the adjoining figure, ABC is a triangle and D is any point in its interior. Show that $BD + DC < AB + AC.$



Watch Video Solution

8. In the given figure, $AP \perp QR, PR > PQ$ and $PQ = PS$. Show that $AR > AQ$.



Watch Video Solution

9. In Figure, AD is a median and BL, CM are perpendiculars drawn from $B\,and\,C$ respectively on $AD\,and\,AD$ produced. Prove that $BL = CM$

Watch Video Solution

10. Suppose line segments $AB\ and\ CD$ intersect at O in such a way that $AO = OD\ and\ OB = OC$. Prove that $AC = BD$ but AC may not be parallel to BD

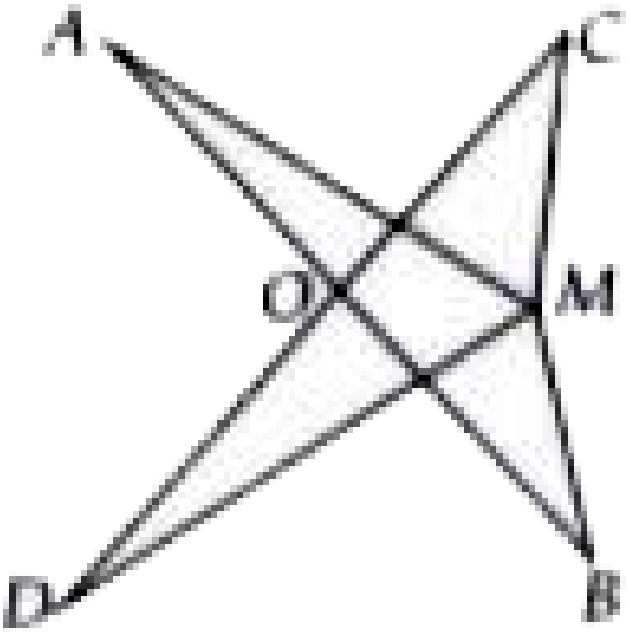
Watch Video Solution

11. A point O is taken inside an equilateral four sided figure $ABCD$ such that its distances from the angular points D and B are equal. Show that AO and OC are in one and the same straight line. GIVEN : A point O inside an equilateral quadrilateral four sided figure $ABCD$ such that $BO = OD$. TO PROVE : AO and OC are in one and the same straight line.

Watch Video Solution

12. In figure, prove that

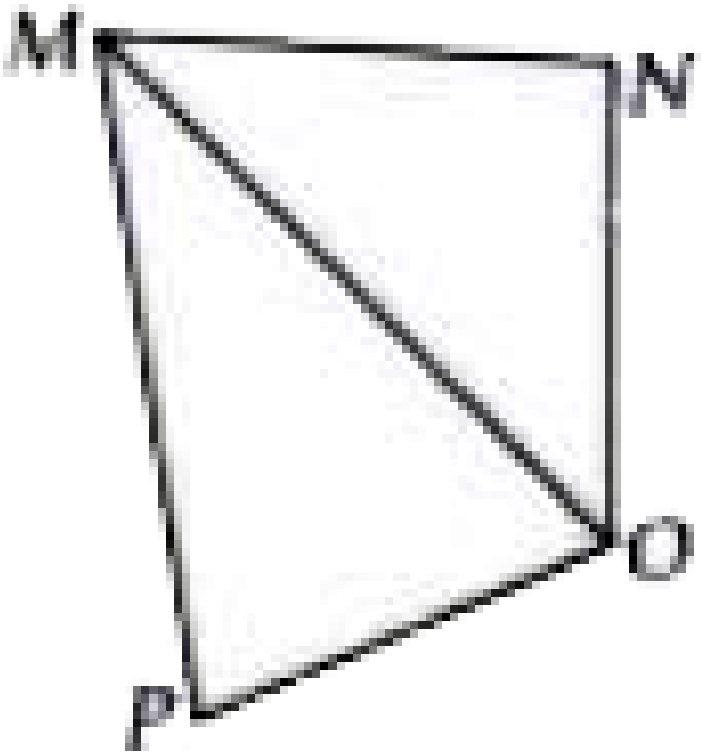
$(AM + BM + CM + DM) > (AO + BO + CO + DO)$



Watch Video Solution

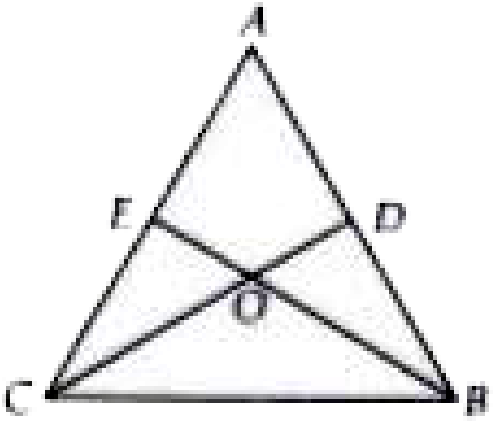
13. In figure prove that

$MN + NO + OP + PM > 2MO$



Watch Video Solution

14. In figure, it is given that AE=AD and BD=CE. Prove that $\Delta AEB \cong \Delta ADC$.

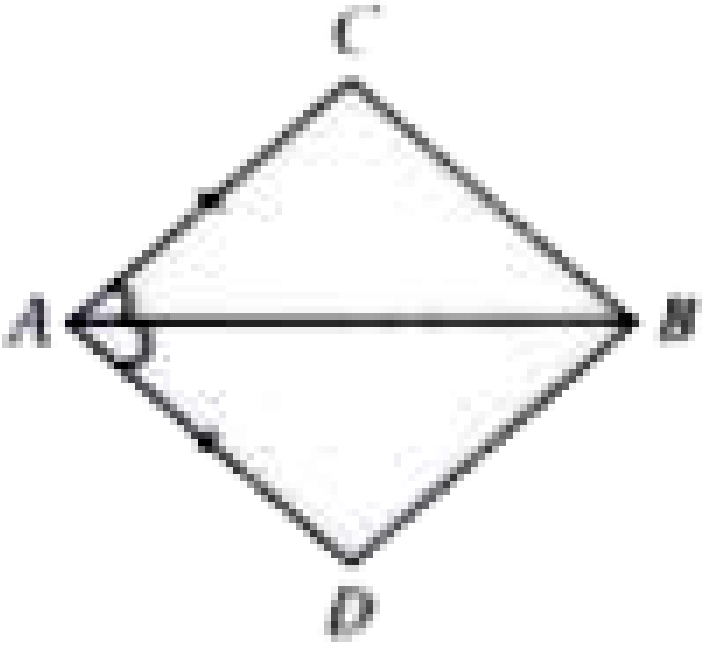


Watch Video Solution

Ncert Section Exercise 7 1

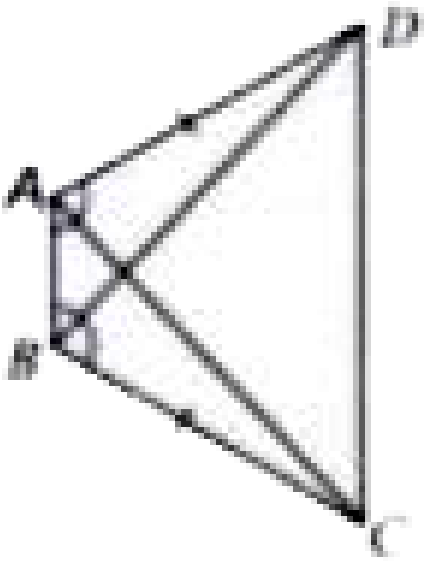
1. In quadrilateral ABCD, AC=AD and AB bisects $\angle A$ (see figure). Show that $\Delta ABC \cong \Delta ABD$. What can you say about BC and

BD ?



Watch Video Solution

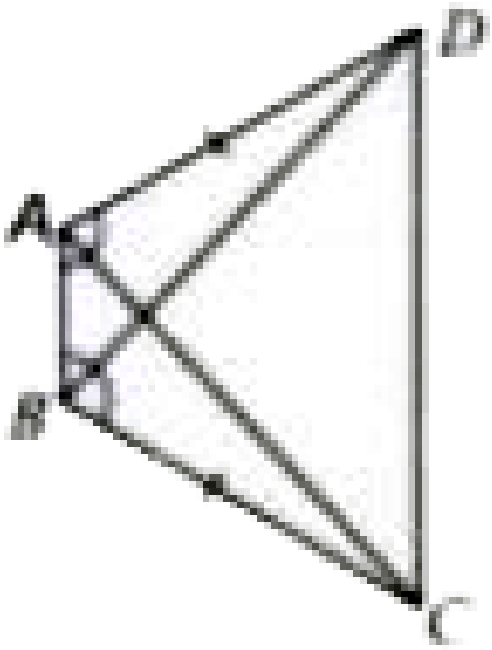
2. ABCD is quadrilateral in which $AD = BC$ and $\angle DAB = \angle CBA$ (see figure). Prove that



$\Delta ABD \cong \Delta BAC$

Watch Video Solution

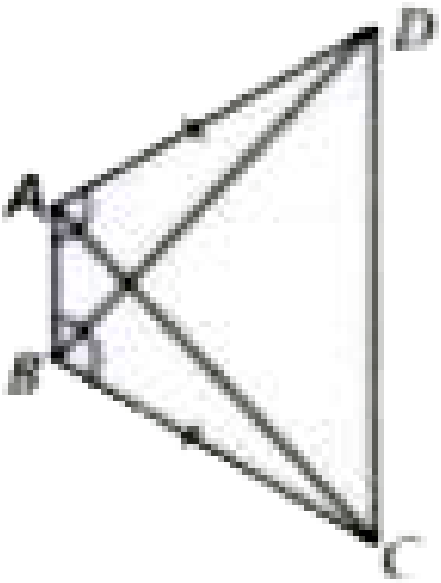
3. ABCD is quadrilateral in which $AD = BC$ and $\angle DAB = \angle CBA$ (see figure). Prove that



$BD = AC$

Watch Video Solution

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



$\angle ADB = \angle BCA.$

Watch Video Solution

5. AD and BC are equal perpendiculars to a line segment AB (see Fig. 7.18). Show that CD bisects AB.

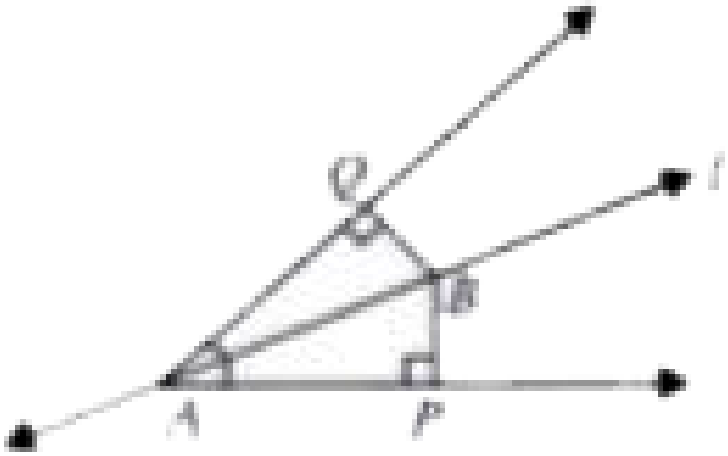
Watch Video Solution

6. l and m are two parallel lines intersected by another pair of parallel lines p and q (see Fig. 7.19). Show that $\Delta ABC \cong \Delta CDA$

.

Watch Video Solution

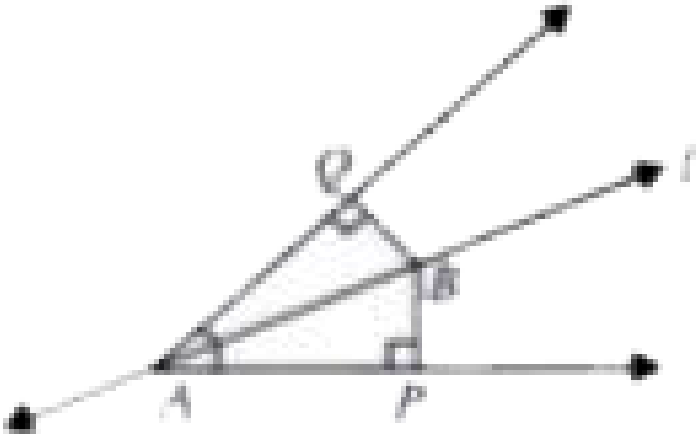
7. Line l is the bisector of an $\angle A$ and B is any point on I. BP and BQ are perpendiculars from B to the arms of $\angle A$ (see figure). Show that:



$\Delta APB \cong \Delta AQB$

Watch Video Solution

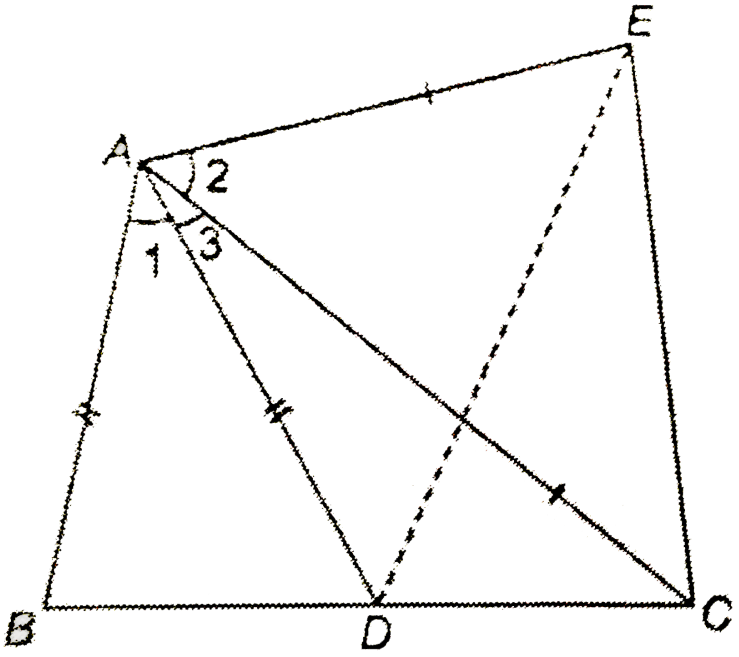
8. Line l is the bisector of an $\angle A$ and B is any point on I. BP and BQ are perpendiculars from B to the arms of $\angle A$ (see figure). Show that:



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

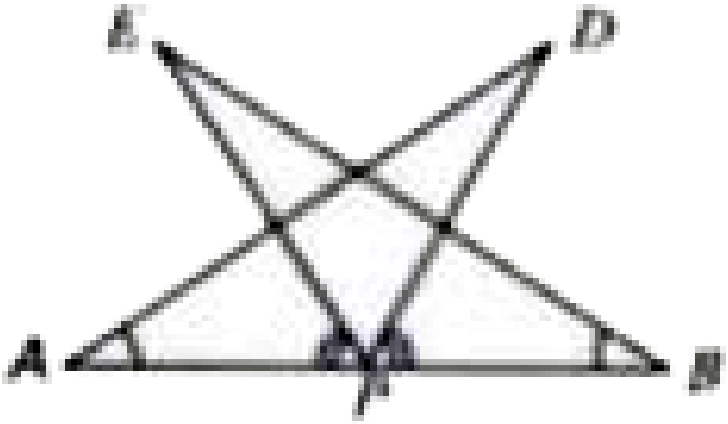
Watch Video Solution

9. In the given figure, $AC = AE, AB = AD$ and $\angle BAD = \angle EAC$. Prove that $BC = DE$.



Watch Video Solution

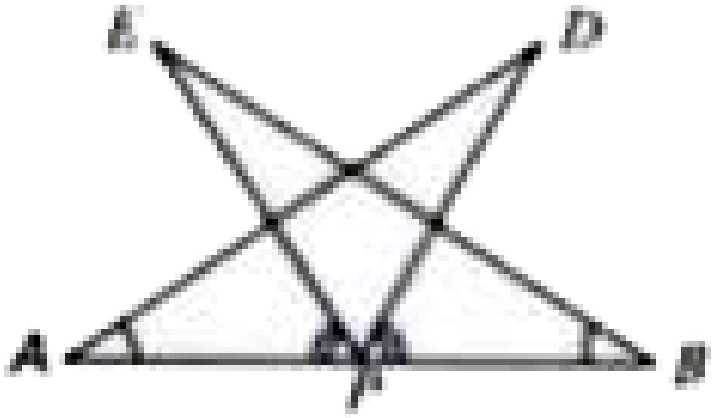
10. AB is a line segment D and P is its mid-point. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (see figure). Show that



$\Delta DAP \cong \Delta EBP$

Watch Video Solution

11. 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



$AD = BE$

Watch Video Solution

12. In right triangle ABC, right angled at C, Mis 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

$\Delta AMC \cong \Delta BMD$

Watch Video Solution

13. In right triangle ABC, right angled at C, Mis 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

$\angle DBC$ is right angle.

Watch Video Solution

14. In right triangle ABC, right angled at C, Mis 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

$\Delta DBC \cong \Delta ACB$

Watch Video Solution

Ncert Section Exercise 7 2

1. Triangle ABC is an isosceles triangle with $AB = AC$. Bisectors of $\angle B$ and $\angle C$ intersect each other at O. join $A - O$ and prove that

$OB = OC$

Watch Video Solution

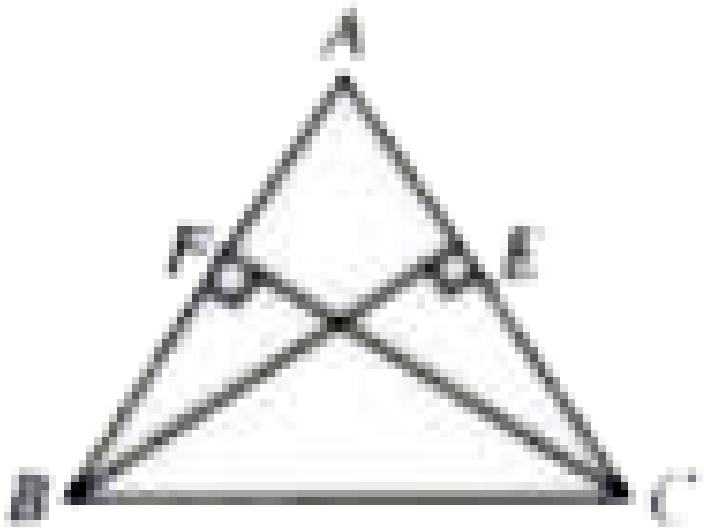
2. In ΔABC, AD is the perpendicular bisector of BC (see Fig. 7.30). Show that $\Delta ABC$is an isosceles triangle in which $AB = AC$.

Watch Video Solution

3. ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively (see Fig. 7.31). Show that these altitudes are equal.

Watch Video Solution

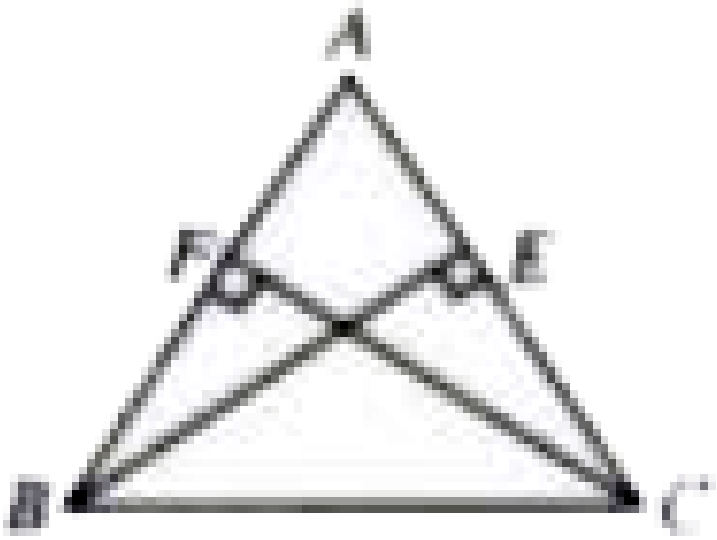
4. ABC is a triangle in which altitudes BE and CF to sides AC and AB are equal (see figure). Show that



$\Delta ABE \cong \Delta ACF$

Watch Video Solution

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



AB=AC, i.e., ABC is an isosceles triangle.

Watch Video Solution

6. ABC and DBC are two isosceles triangles on the same base BC (see Fig. 7.33). Show that $\angle ABD = \angle ACD$

Watch Video Solution

7. DABC is an isosceles triangle in which $AB\backslash = \backslash AC$. Side BA is produced to D such that $AD\backslash = \backslash AB$ (see Fig. 7.34). Show that $\angle BCD$ is a right angle.

Watch Video Solution

8. ABC is a right angled triangle in which $\angle B = 90^\circ$ and $AB = BC$. Find $\angle A$ and $\angle C$.

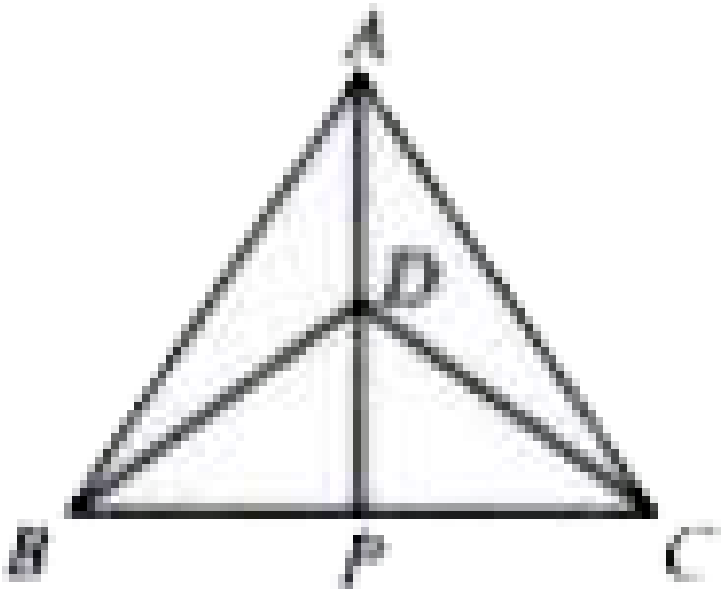
Watch Video Solution

9. Show that the angles of an equilateral triangle are $60o$each.

Watch Video Solution

Ncert Section Exercise 7 3

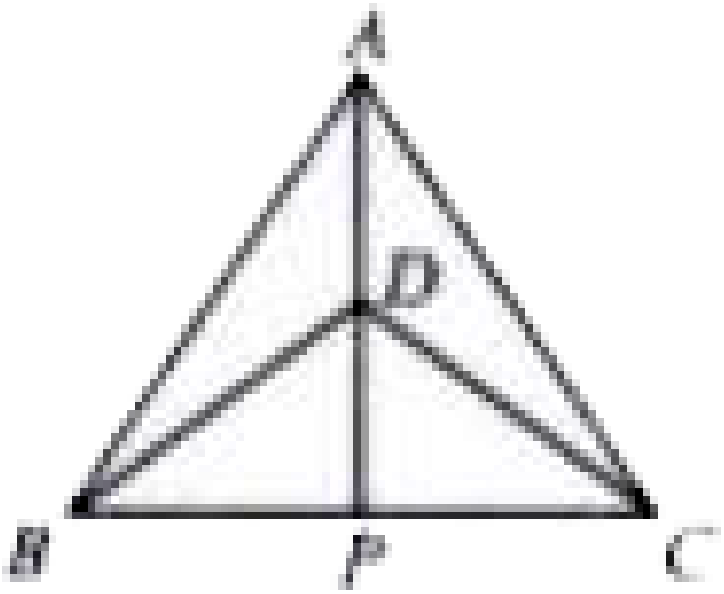
1. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (see figure). If AD is extended to BP intersect BC at P, show that



$\Delta ABD \cong \Delta ACD$

Watch Video Solution

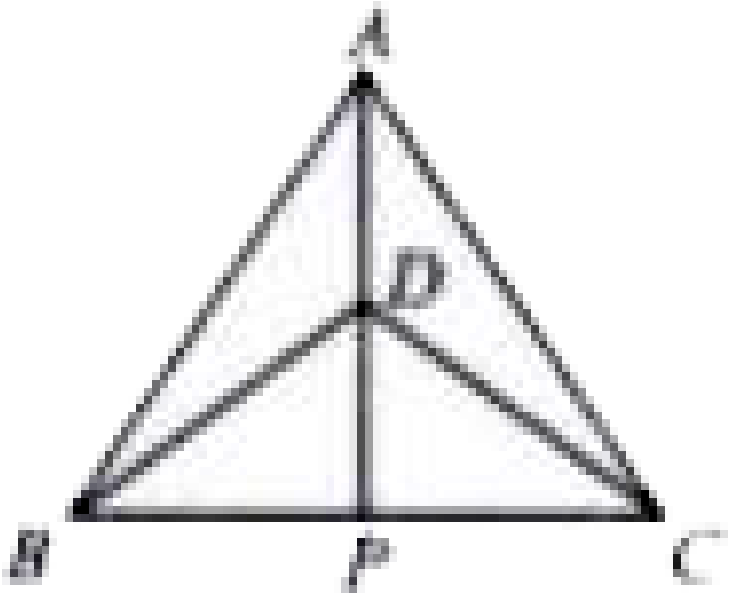
2. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (see figure). If AD is extended to BP intersect BC at P, show that



$\Delta ABP \cong \Delta ACP$

Watch Video Solution

3. 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 BP intersect BC at P, show that



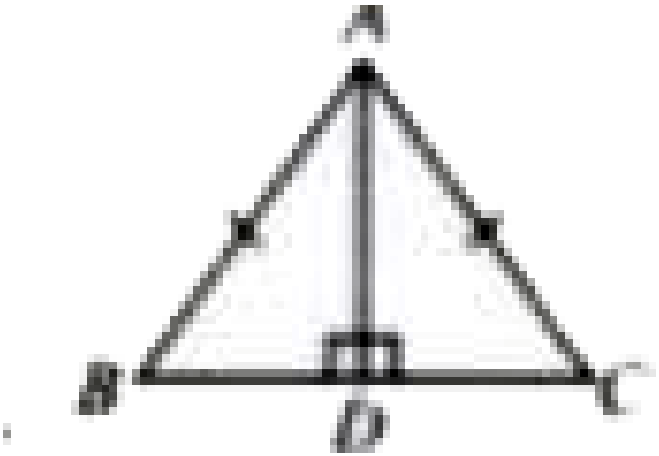
AP bisects $\angle A$ as well as $\angle D$.

Watch Video Solution

4. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC. If AD is extended to intersect BC at E show that

Watch Video Solution

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

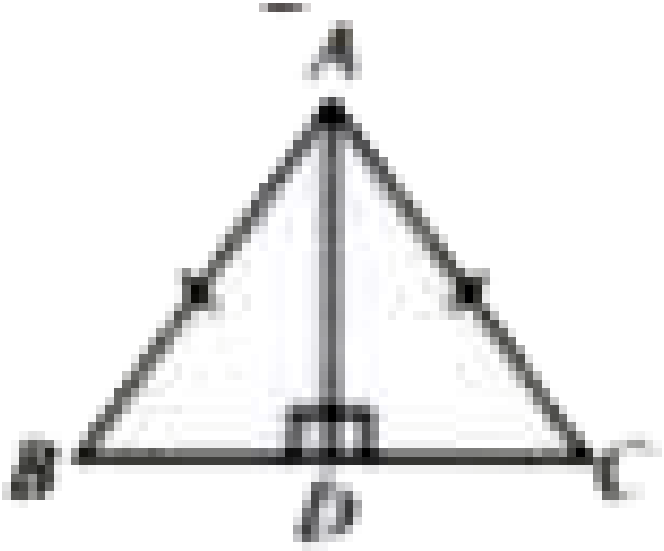


AD bisects BC

Watch Video Solution

6. AD is an altitude of an isosceles triangle ABC in which AB = AC.

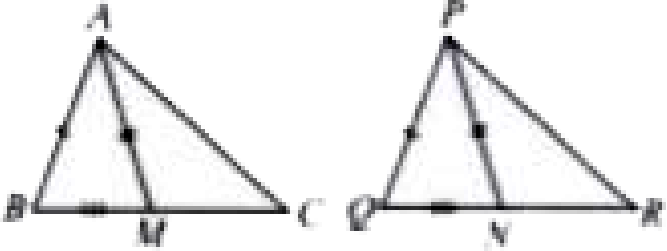
Show that



AD bisects $\angle A$

Watch Video Solution

7. 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



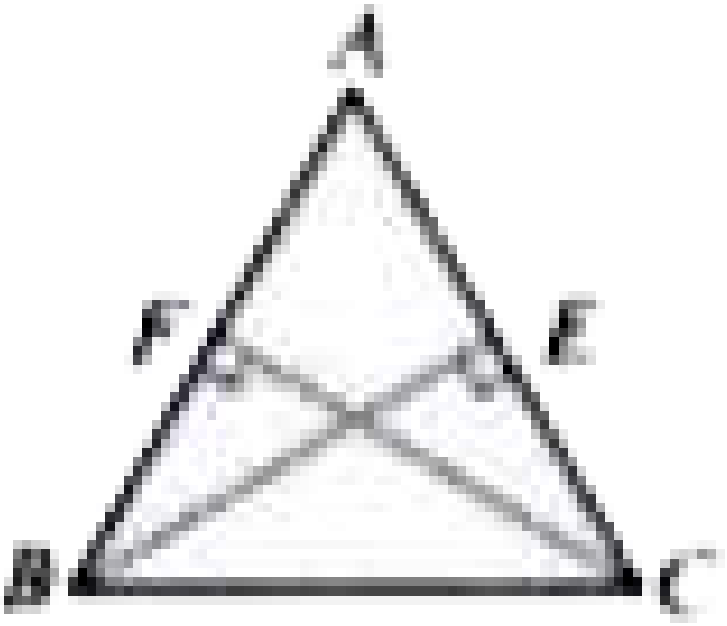
$\Delta ABM \cong \Delta PQN$

Watch Video Solution

8. The sides AB and BC and the median AD of triangle ABC are equal to the sides PQ and QR and the median PM of triangle PQR respectively. Prove that the triangles ABC and PQR are congruent.

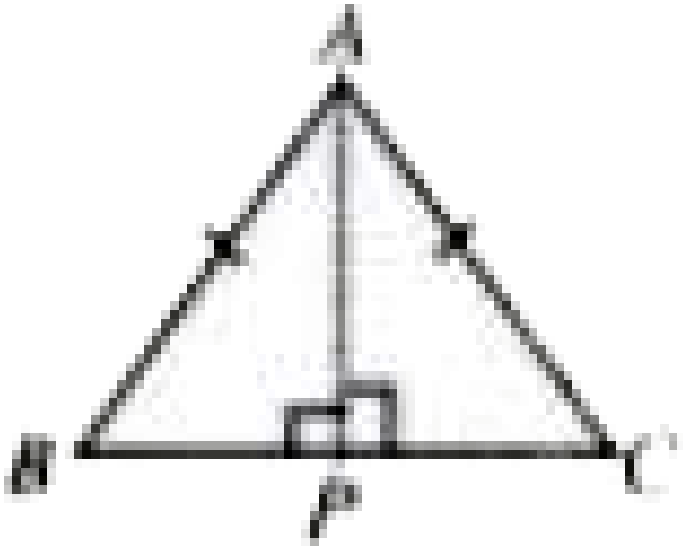
Watch Video Solution

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



Watch Video Solution

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



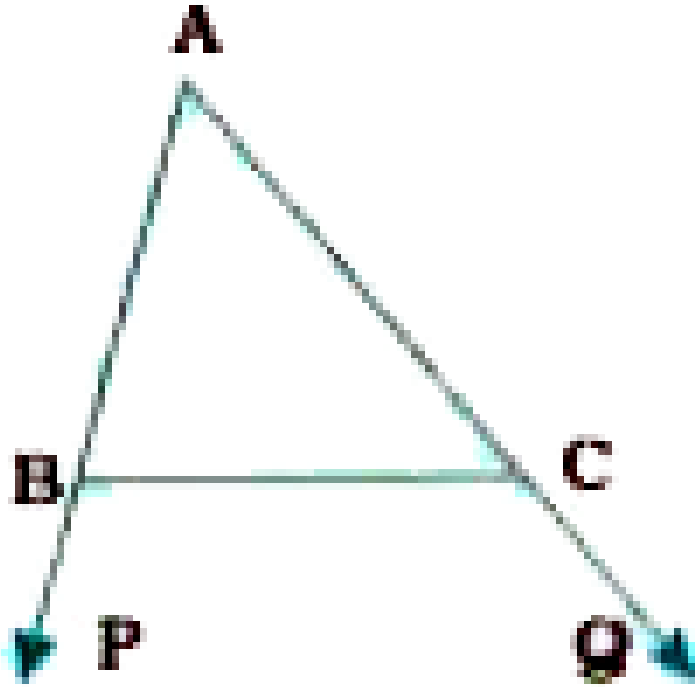
Watch Video Solution

Ncert Section Exercise 7 4

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

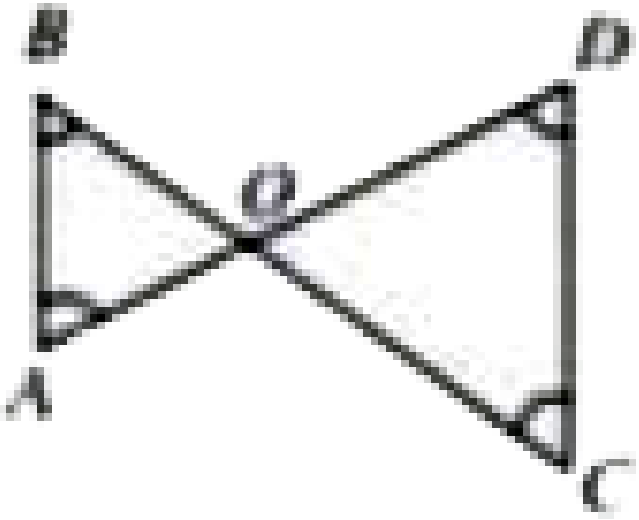
Watch Video Solution

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



Watch Video Solution

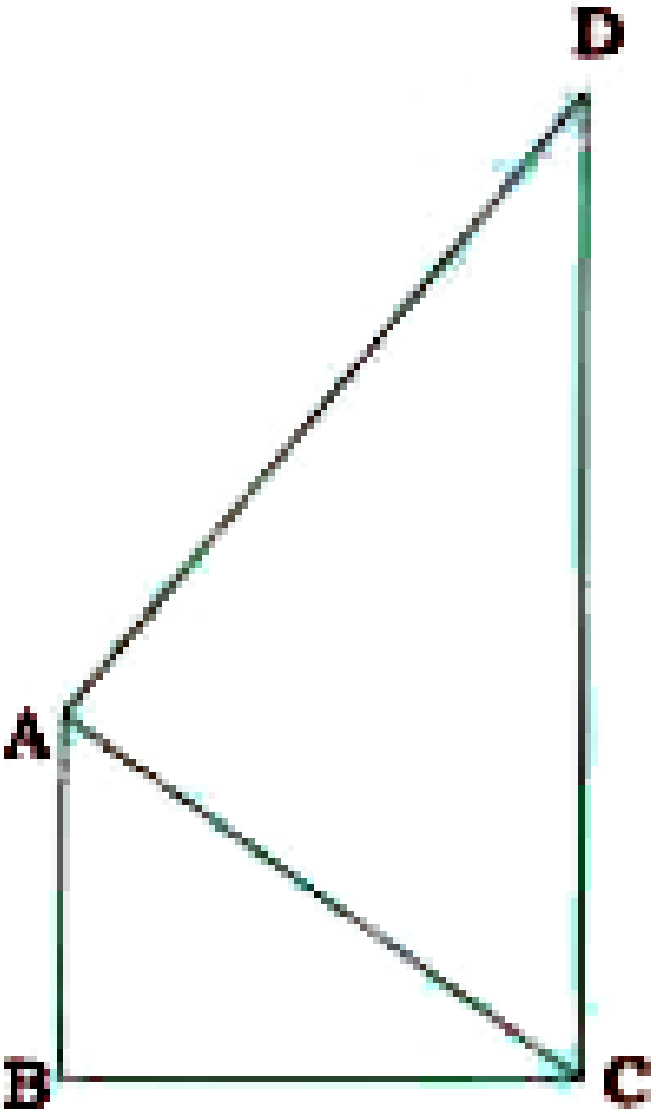
3. In the figure $\angle B < \angle A$ and $\angle C < \angle D$. Show that $AD < BC$.



Watch Video Solution

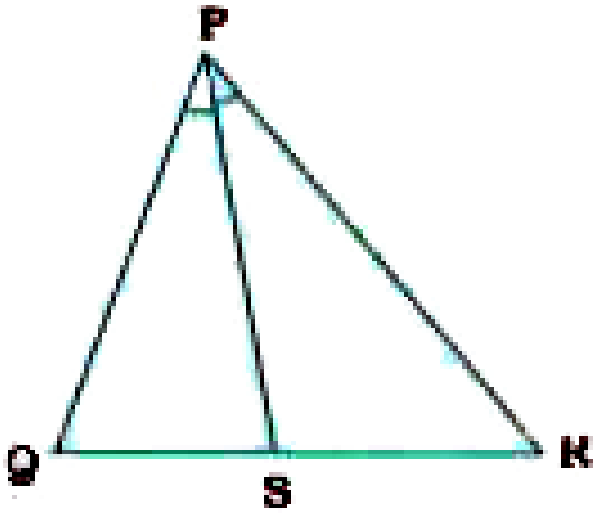
4. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see th e given figure). Show that $\angle A > \angle C$

and $\angle B > \angle D$



Watch Video Solution

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



Watch Video Solution

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

Watch Video Solution

Ncert Section Exercise 7 5

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

Watch Video Solution

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

Watch Video Solution

3. 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 ice cream parlour be set up so that maximum number of persons can approach it?

Watch Video Solution

4. Complete the hexagonal and star shaped Rangolies (see fig. (i) and (ii)] 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?

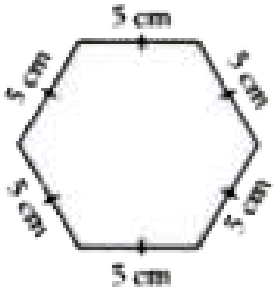


Fig. (i)

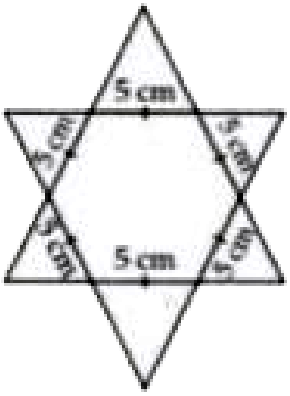


Fig. (ii)

Watch Video Solution

Exercise Multiple Choice Questions Level 1

1. In a $\Delta ABC, AB = 5cm, AC = 5cm$ and angleA=50°, then $\angle B =$

A. 35°

B. 65°

C. 80°

D. 40°

Answer: B

Watch Video Solution

2. Theorem 7.6 : If two sides of a triangle are unequal, the angle opposite to the longer side is larger (or greater)

A. greater

B. less

C. equal

D. half

Answer: A

Watch Video Solution

3. In triangle $PQ = QR, \angle QPR = 48^\circ, \angle SRP = 18^\circ$ then $\angle PQR$=

A. 48°

B. 84°

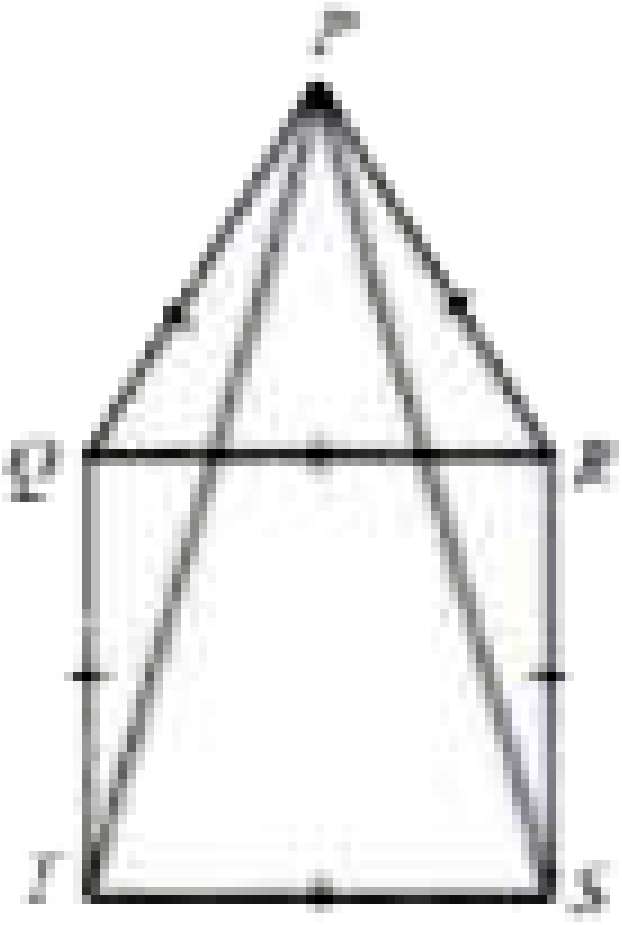
C. 30°

D. 36°

Answer:

Watch Video Solution

4. In the given figure, PQR is an equilateral triangle and QRST is a square. Then $\angle PSR =$



Watch Video Solution

5. Can we drawn a triangle, ABC with AB=3 cm, BC= 3.5 cm and Ca=65 cm ?

A. Yes

B. No

C. Can't be determined

D. None of these

Answer: B

Watch Video Solution

6. Which of the following is not a criterion for congruence of triangles ?

A. SS

B. SAS

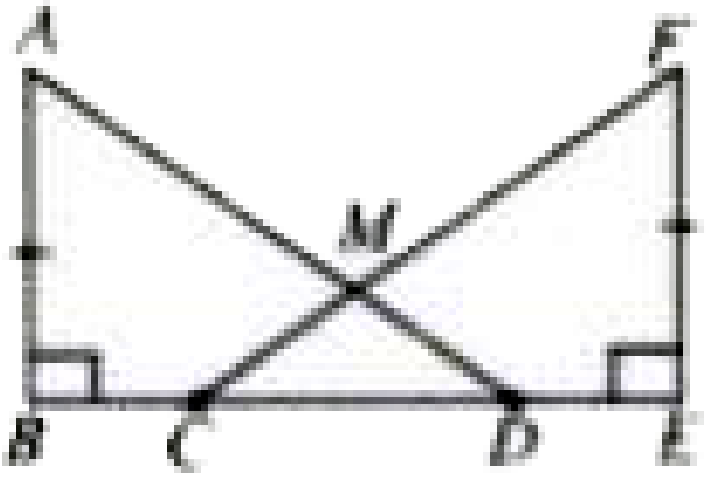
C. ASA

D. SSS

Answer: A

Watch Video Solution

7. In the given figure $AB \perp BE$ and $EF \perp BE$. Also BC=DE and AB= EF. Then



A. $\Delta ABD \cong \Delta EFC$

B. $\Delta ABD \cong \Delta EFC$

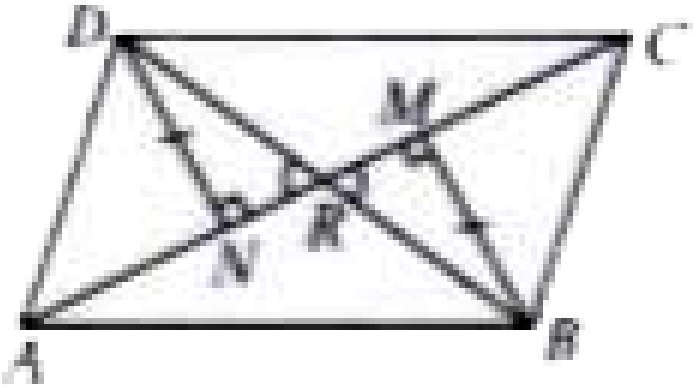
C. $\Delta ABD \cong \Delta CMD$

D. $\Delta ABD \cong \Delta CEF$

Answer: A

Watch Video Solution

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

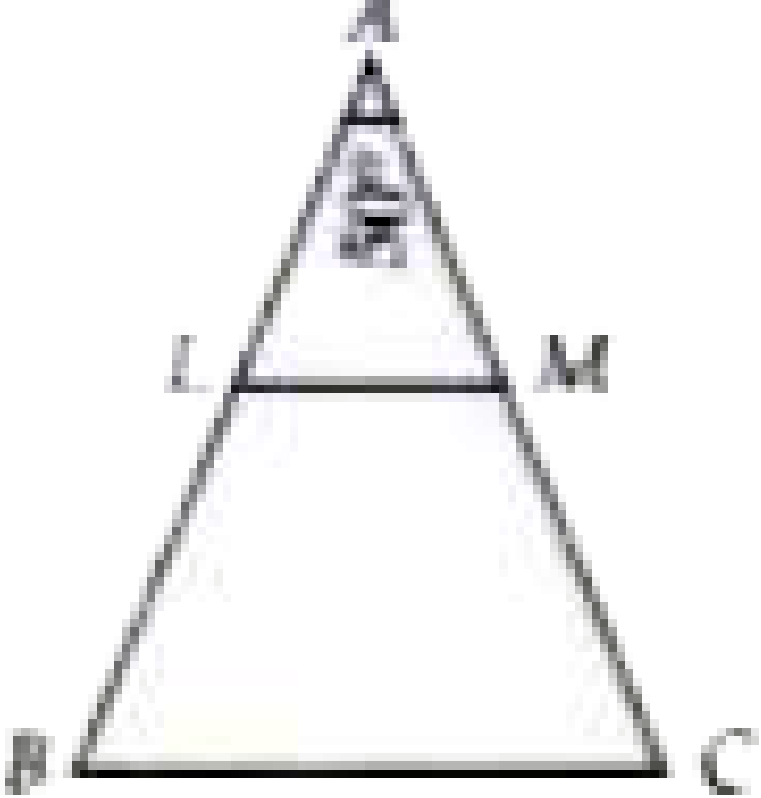
C. 12 cm

D. 16 cm

Answer: D

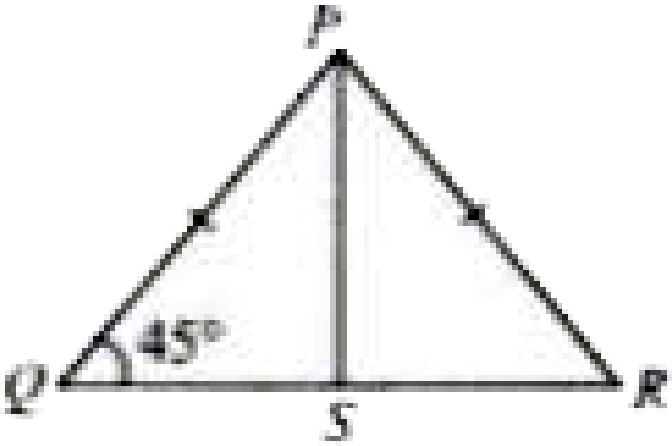
Watch Video Solution

9. In the figure, ABC is an isosceles triangle in which AB = AC and LM is parallel to BC. If $\angle A = 50^\circ$ find $\angle LMC$.



Watch Video Solution

10. In the given figure, PS is the median, bisecting angle P, then $\angle QPS$ is



A. 110°

B. 70°

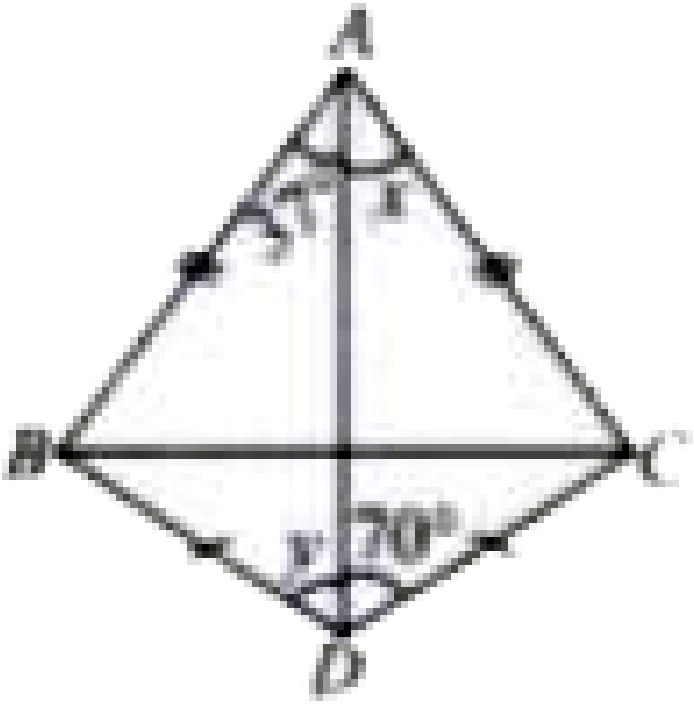
C. 45°

D. 55°

Answer: C

Watch Video Solution

11. In the given figure, x and y are



A. $x = 70^\circ, y = 37^\circ$

B. $x = 37^\circ, y = 70^\circ$

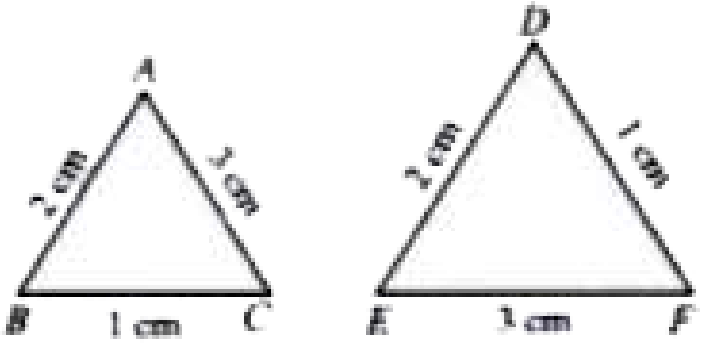
C. $x + y = 117^\circ$

D. $x - y = 100^\circ$

Answer: B

View Text Solution

12. For the given triangles, write the correspondence, if they are congruent.



A. $\Delta ABC \cong \Delta DEF$

B. $\Delta ABC \cong \Delta EDF$

C. $\Delta ABC \cong \Delta FDE$

D. not congruent

Answer: B

Watch Video Solution

13. In ΔABC, if $\angle B < \angle A$ then

A. $BC < CA$

B. $BC < CA$

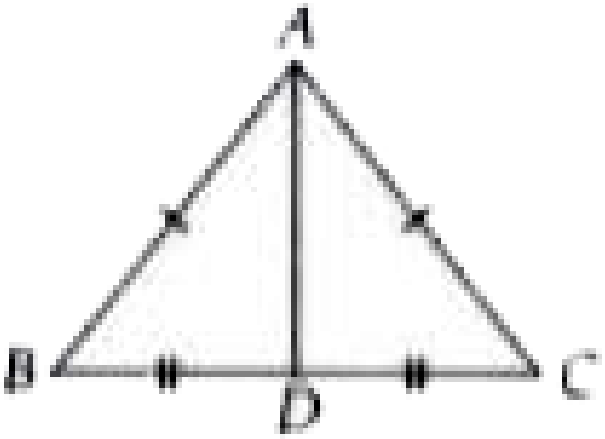
C. $BC > AB + CA$

D. $AB < CA$

Answer: A

Watch Video Solution

14. In ΔABC, if $AB = AC$ and $BD = DC$ (see figure), then $\angle ADC =$



A. 60°

B. 45°

C. 120°

D. 90°

Answer: D

Watch Video Solution

15. Which of the following is a correct statement?

A. Two triangles having same shape are congruent.

B. If two sides of a triangle are equal to the corresponding sides of another triangle, then the two triangles are congruent.

C. If the hypotenuse and one side of one right triangle are equal to the hypotenuse and one side of the other triangle, then the triangles are not congruent.

D. None of these

Answer: D

Watch Video Solution

16. D is a point on the side BC of a ΔABC such that AD bisects $\angle BAC$. Then

A. $BD = CD$

B. $BA > BD$

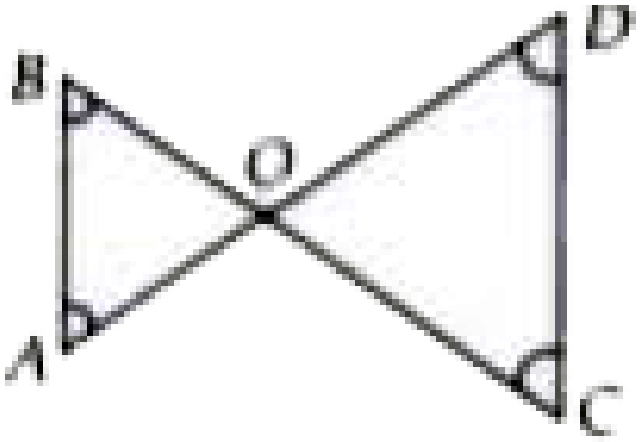
C. $BD > BA$

D. $CD > CA$

Answer: B

Watch Video Solution

17. In figure, $\angle B < \angle A$ and $\angle C < \angle D$ then



A. $AD < BC$

B. $OD > OC$

C. $OB < OA$

D. None of these

Answer: A

Watch Video Solution

18. Which of the following is a correct statement?

A. In an isosceles triangle, the angles opposite to equal sides are equal.

B. If the hypotenuse and an acute angle of the right-angled triangle are not equal to the hypotenuse and the corresponding acute angle of another triangle, then the triangles are congruent.

C. The bisector of the vertical angle of an isosceles triangle bisects the base at acute angles.

D. All of these

Answer: A

Watch Video Solution

19. In ΔABC and ΔPQR, If AB=AC, $\angle C = \angle P$ and $\angle B = \angle Q$, then the two triangles are

A. isosceles but not necessarily congruent

B. isosceles and congruent

C. congruent but not isosceles

D. neither congruent nor isosceles

Answer: A

Watch Video Solution

20. In ABC, side AB is produced to D so that $BD = BC$. If $\angle B = 60^0$ *and* $\angle A = 70^0$, prove that: $AD > CD$ (ii) $AD > AC$

A. $AD > CD$

B. $\angle ADC = 90^\circ$

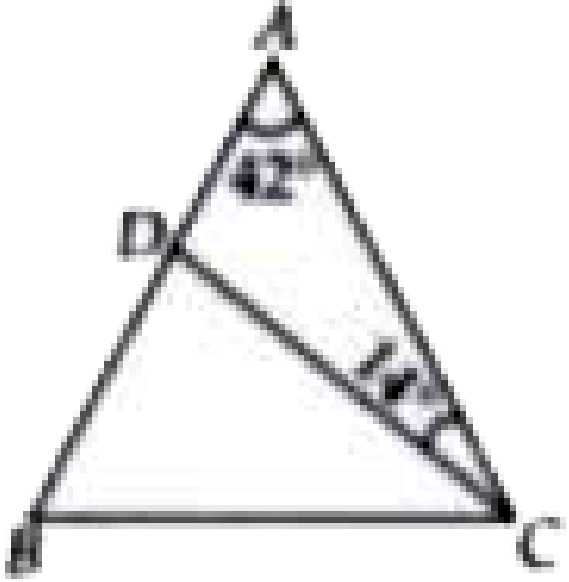
C. $AD < CD$

D. $\angle CAD = 30^\circ$

Answer: A

Watch Video Solution

21. In the given figure, AB=AC, $\angle A = 42^\circ$ and $\angle ACD = 14^\circ$, $\angle BCD$ is equal to



A. 55°

B. 69°

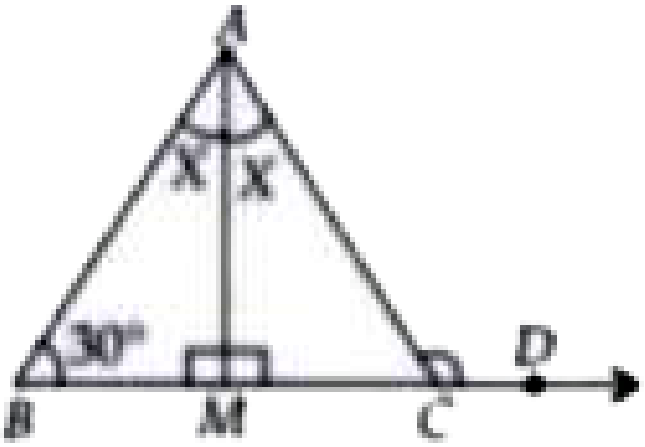
C. 45°

D. 50°

Answer: A

Watch Video Solution

22. In the given figure, find the measure of $\angle ACD$.



A. 150°

B. 120°

C. 140°

D. 160°

Answer: A

Watch Video Solution

23. If S is any point on the side QR of a ΔPQR, then

A. $PQ + QR + RP > 2PS$

B. $PQ + QR + RP < 2PS$

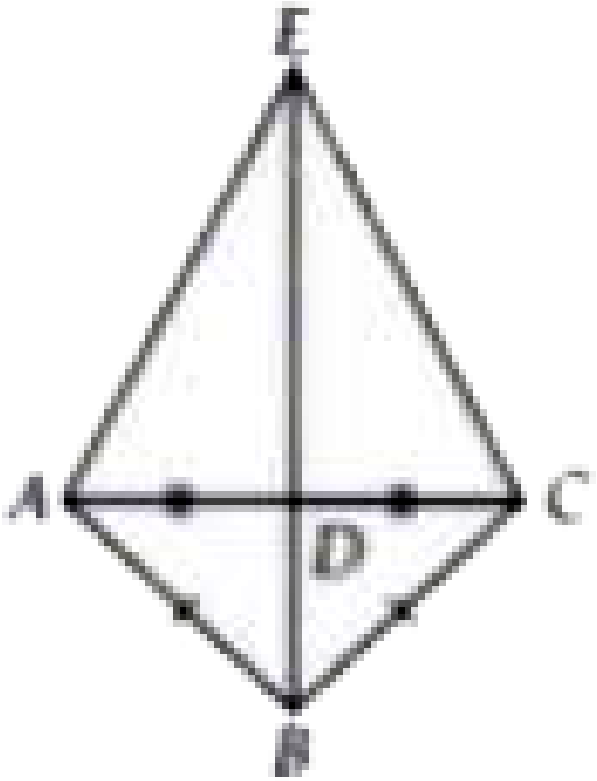
C. $PQ + QR + RP = 3PS$

D. None of these

Answer: C

Watch Video Solution

24. In the given figure, AB = BC, AD = CD. Then, which of the following is true?



A. $\angle ADE = 90^\circ$

B. $AE = EC$

C. Both (a) and (b)

D. AE=BC

Answer: C

Watch Video Solution

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

A. 144°

B. 36°

C. 72°

D. 98°

Answer: C

Watch Video Solution

26. Which of the following pairs of triangles is congruent?

A. $\Delta ABC: AC = 2cm, BC = 3cm$ and $\angle 72^\circ$

$\Delta DEF: DE = 2cm, DF = 3cm$ and $\angle D = 72^\circ$

B. $\Delta ABC: AB = 4cm, AC = 8cm$ and $\angle A = 90^\circ$

$\Delta PQR: PQ = 4cm, Qr = 8cm$ and $\angle A = 90^\circ$

C. ΔBC and ΔDEF in which $BC = EF, \angle A = 90^\circ,$

$\angle B = \angle E = 50^\circ$ and $\angle F = 40^\circ$

D. None of these

Answer: C

View Text Solution

27. In a quadrilateral ABCD, AC bisects $\angle C$ and BC = CD, then which of the following statement is false?

A. $AB = AD$

B. AC is the perpendicular bisector of BD.

C. $\Delta DCO \cong \Delta BCO$

D. None of these

Answer: D

View Text Solution

28. In an isosceles triangle ΔABC, if $\angle B = 70^\circ$ find $\angle A$

A. 40°

B. 70°

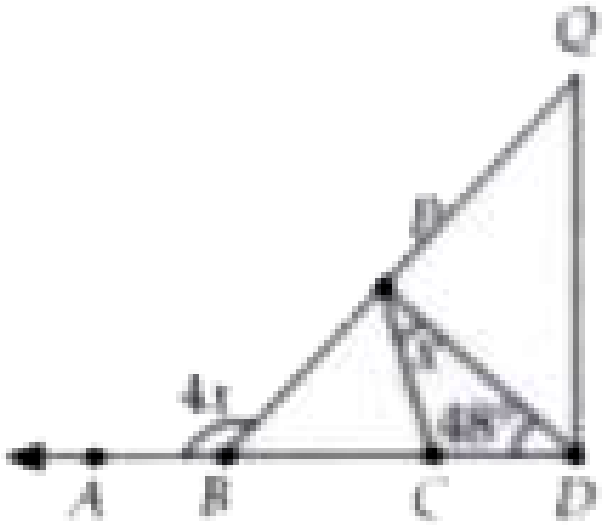
C. 60°

D. 90°

Answer: A

Watch Video Solution

29. In the given figure, ABCD and BPQ are straight lines. If BP = BC and DQ is parallel to CP. Find $\angle BDQ$



A. 48°

B. 45°

C. 90°

D. 96°

Answer: D

View Text Solution

30. The vertical angle of an isosceles triangle is 100°. Find its base angles

A. 100°

B. 40°

C. 80°

D. 90°

Answer: B

Watch Video Solution

31. ABCD is a square and ABE is an equilateral triangle outside the square then

A. $\angle ACE = \frac{1}{2}\angle ABE$

B. $\angle ACE = \angle ABE$

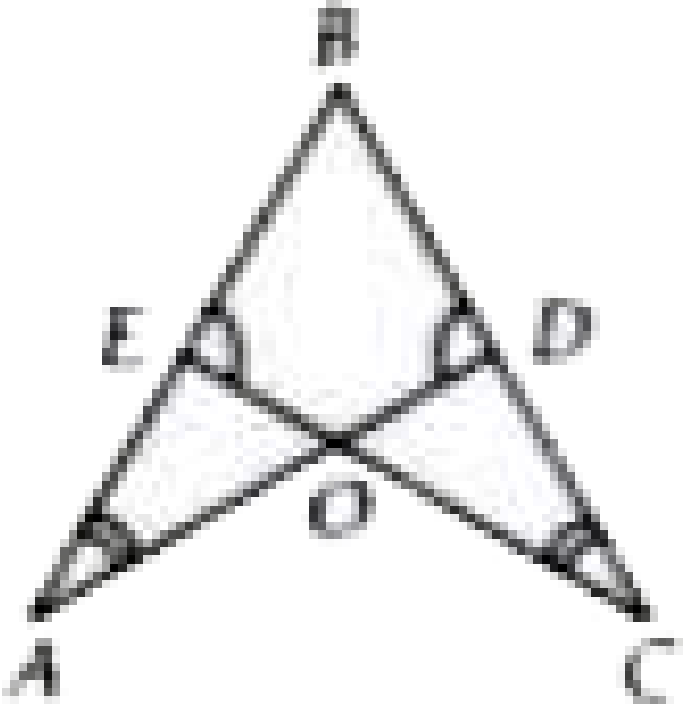
C. $\angle ACE = 2\angle ABE$

D. None of these

Answer: A

Watch Video Solution

32. In given figure, $\angle A = \angle C$ and $AB = BC$. Then which of following is correct?



A. $\angle OEB = \angle ODB$

B. $\Delta ABD \cong \Delta CBE$

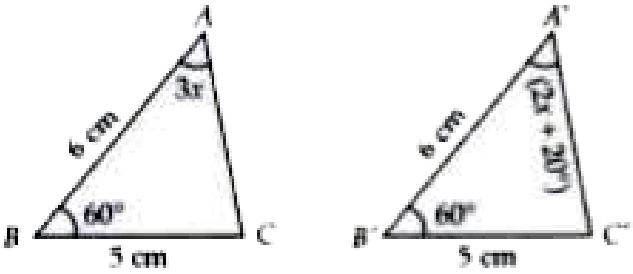
C. $\angle AEO = \angle CDO$

D. All of these

Answer: D

Watch Video Solution

33. In given figures, the measure of $\angle BAC$ is



A. 50°

B. 60°

C. 70°

D. 80°

Answer: B

Watch Video Solution

34. In a $\triangle ABC$,if $2\angle A = 3\angle B = 6\angle C$ calculate $\angle A$, $\angle B$ and $\angle C$

A. $90^\circ, 60^\circ, 30^\circ$

B. $45^\circ, 60^\circ, 85^\circ$

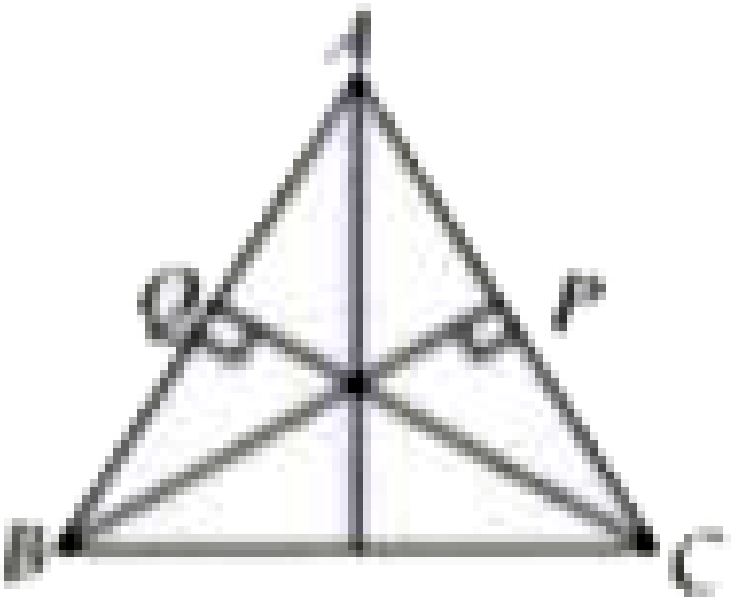
C. $30^\circ, 60^\circ, 90^\circ$

D. $35^\circ, 55^\circ, 90^\circ$

Answer: A

Watch Video Solution

35. If in ΔABC, $AB = AC$ (see figure), BP and CQ be the altitudes from the vertices to their opposite sides, then



A. $BP = CQ$

B. $AP = AQ$

C. $\angle ABC = \angle ACB$

D. All of these

Answer: D

Watch Video Solution

Exercise Multiple Choice Questions Level 2

1. The sum of altitudes of a triangle is than the perimeter of the triangle._____

A. greater

B. equal

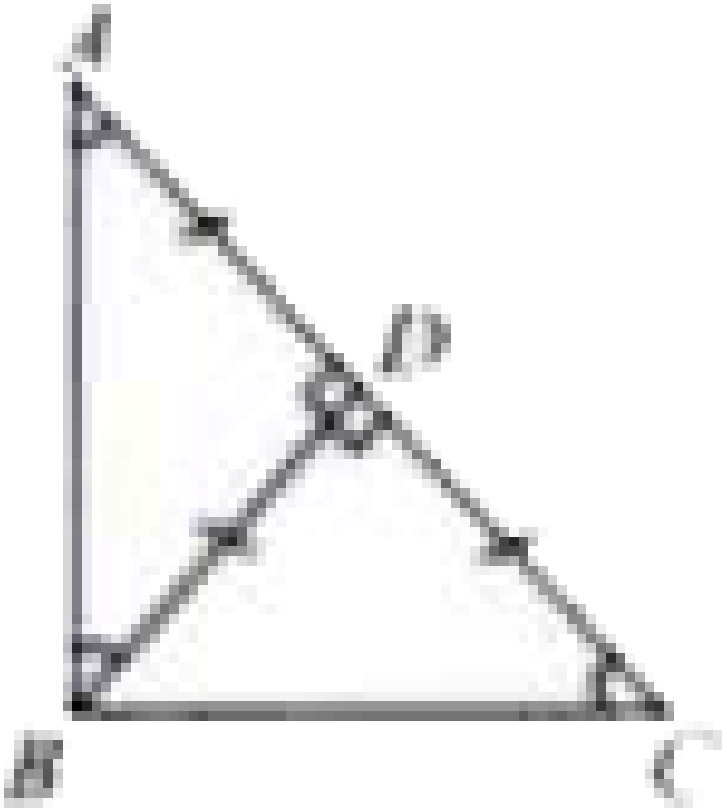
C. half

D. less

Answer: D

Watch Video Solution

2. In the given figure, $BD \perp AC$, the measure of $\angle ABC$ is



A. 60°

B. 30°

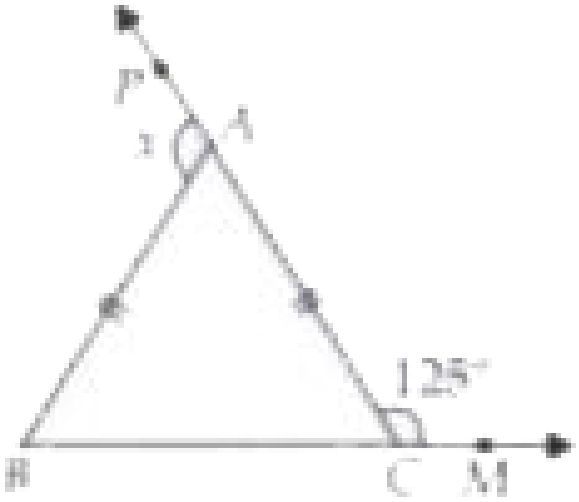
C. 45°

D. 90°

Answer: D

Watch Video Solution

3. In figure AB=AC, angleACM $=125^\circ$ and anglePAB=x. Find the value of x.



A. 130°

B. 110°

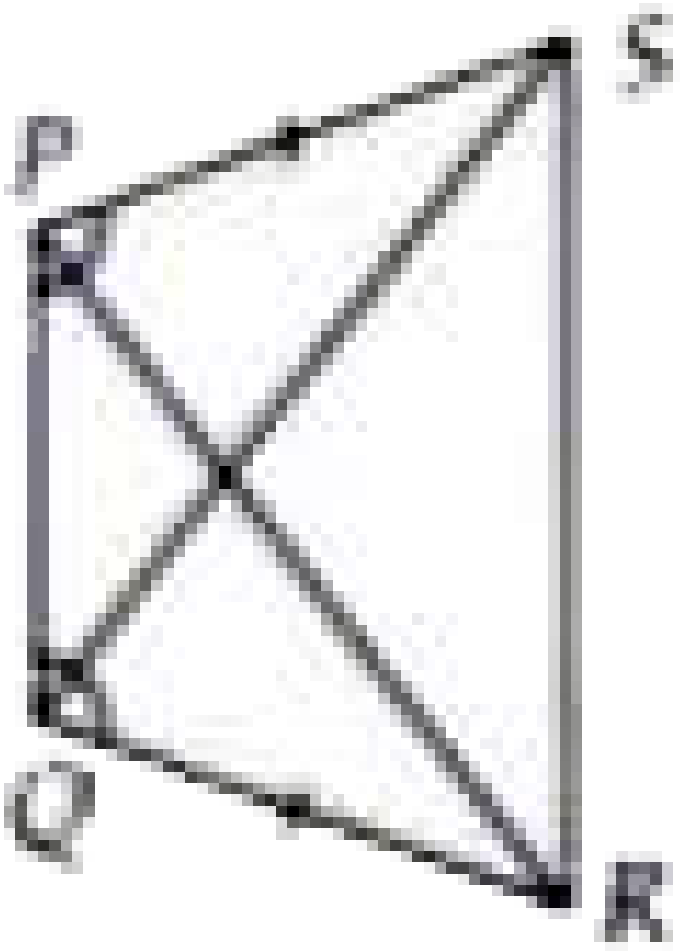
C. 100°

D. 120°

Answer: B

Watch Video Solution

4. In given figure, PS = QR and $\angle SPQ = \angle RQP$. If QS=8 m then PR=



A. 8 m

B. 4 m

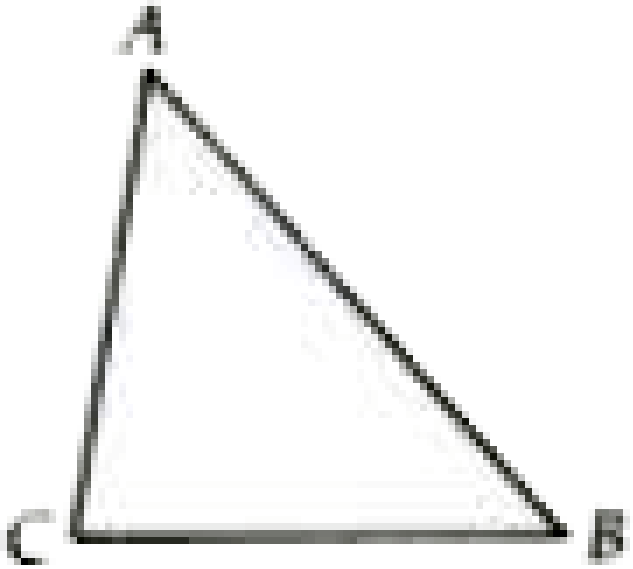
C. 16 m

D. None of these

Answer: A

Watch Video Solution

5. In ΔABC if AB is the greatest side then



A. $\angle C > 60^\circ$

B. $\angle B > 60^\circ$

C. $\angle A > 60^\circ$

D. $\angle C < 60^\circ$

Answer: A

Watch Video Solution

6. A triangle ABC is an isosceles triangle if any one of the following conditions hold: Altitude AD bisects $\angle BAC$ Bisector of $\angle BAC$ is perpendicular to the base BC

A. altitude AD bisects $\angle BAc$

B. Bisector of $\angle BAC$ is perpendicular to the base BC.

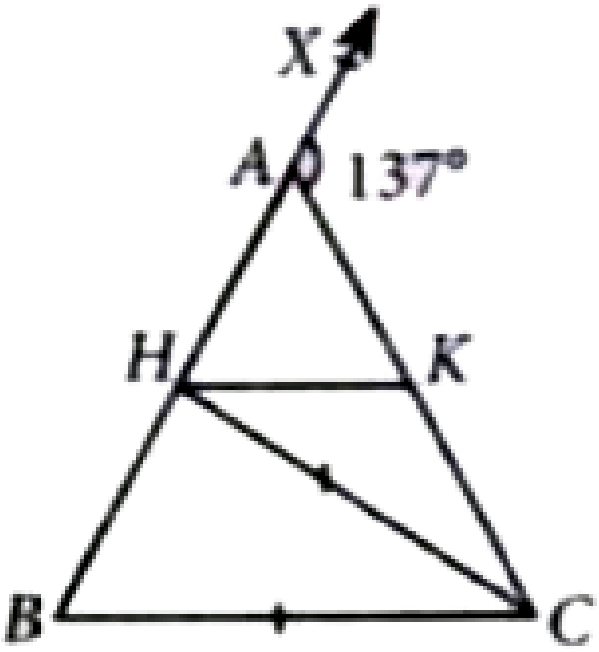
C. Both (a) and (b)

D. None of these

Answer: C

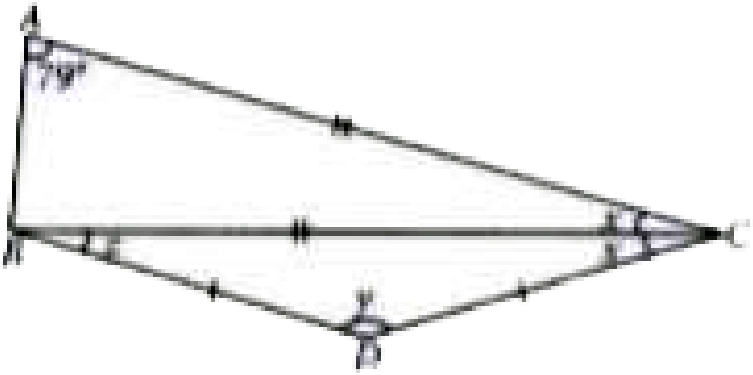
Watch Video Solution

7. In the given figure, AB=AC, CH=CB and HK ||BC. If $\angle CAX = 137^\circ$ and $\angle CHK = K^\circ$, then the value of K is.....



Watch Video Solution

8. In the given figure $\angle BAC = 79^\circ$, CA=CB and BD=CD. Find the measurees of $\angle x, \angle y$ and $\angle z$.



A. $126^\circ, 132^\circ, 26^\circ$

B. $48^\circ, 96^\circ, 48^\circ$

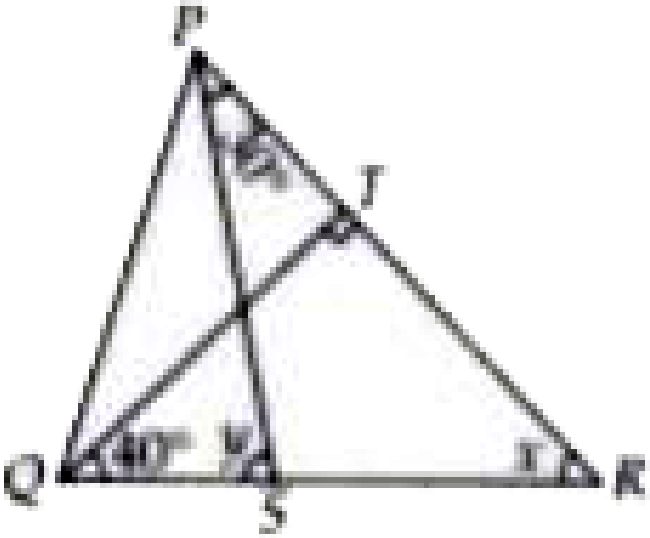
C. $132^\circ, 48^\circ, 26^\circ$

D. None of these

Answer: D

Watch Video Solution

9. In figure, if $QT \perp PR, \angle TQR = 40^\circ$ and $\angle SPR = 30^\circ$, find value of y-x



A. 80°

B. 50°

C. 30°

D. 130°

Answer: C

Watch Video Solution

10. O is a point in the interior of a square ABCD such that ΔQAB is an equilateral triangle . Show that ΔOCD is an isoceles triangle .

A. scalene triangle

B. isosceles triangle

C. equilateral triangle

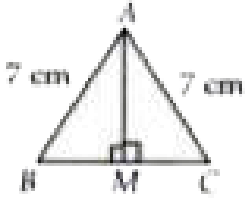
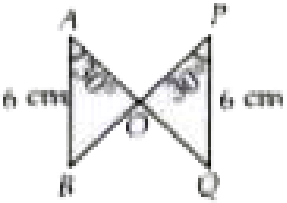
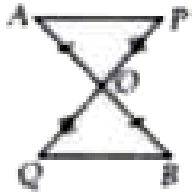
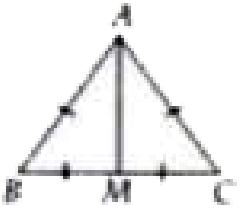
D. right angled triangle

Answer: B

Watch Video Solution

Exercise Multiple Choice Questions Match The Following

1. Match the following :

List-I		List-II
(P)  $\Delta AMB \cong \Delta AMC$ by		(1) SAS Rule
(Q)  $\Delta AOB \cong \Delta POQ$ by		(2) RHS Rule
(R)  $\Delta AOP \cong \Delta BOQ$ by		(3) SSS Rule
(S)  $\Delta AMB \cong \Delta AMC$ by		(4) AAS Rule

A. P-2,Q-4, R-1, S-3

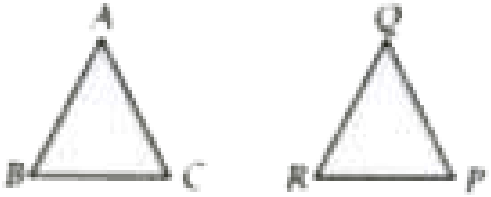
B. P-4, Q-2, R-1, S-3

C. P-1, Q-2, R-4, S-3

D. P-2, Q-1, R-3, S-4

Answer: A

Watch Video Solution



$\Delta ABC \cong \Delta QRP$. Match the following :

List-I		List-II	
(P)	$AB =$	(1)	$\angle Q$
(Q)	$BC =$	(2)	QP
(R)	$AC =$	(3)	QR
(S)	$\angle A =$	(4)	RP

2. $\Delta ABC \cong \Delta QRP$. Match the following :

(P)	$AB =$	(1)	$\angle Q$
(Q)	$BC =$	(2)	QP
(R)	$AC =$	(3)	QR
(S)	$\angle A =$	(4)	RP

A. P-1, Q-2, R-3, S-4

B. P-3, Q-2, R-4, S-1

C. P-3, Q-4, R-2, S-1

D. P-2, Q-3, R-4, S-1

Answer: C

View Text Solution

Exercise Multiple Choice Questions Assertion Reason Type

1. Assertion : If we draw two triangles with angles $30^\circ, 70^\circ \text{ and } 80^\circ$ 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 : 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.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

View Text Solution

2. Assertion : In ΔABC and $\Delta PQR, AB = PQ AC = PR$ and $\angle BAC = \angle QPR$

$\therefore \Delta ABC \cong \Delta PQR$

Reason : Both the triangles are congruent by SSS congruence.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

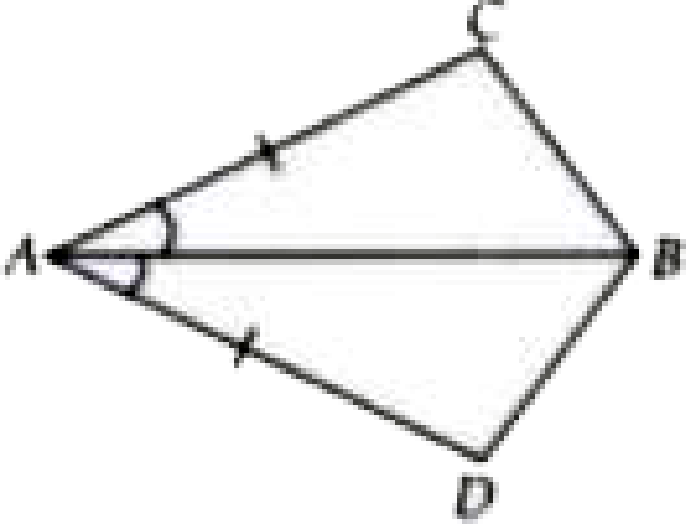
C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C

Watch Video Solution

3. Assertion : In a quadrilateral ACBD, AC = AD and AB bisects $\angle A$ (see figure) then $\Delta ACB \cong \Delta ADB$ by SAS congruence criteria.



Reason : Two triangles are congruent if two sides and the included angle of one triangle is equal to the corresponding two sides and included angle of the other.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A

Watch Video Solution

4. Assertion: In triangles ABC and PQR, $\angle A = \angle P, \angle C = \angle R$ and $AC = PR$. The two triangles are congruent by ASA congruence.

Reason : If two angles and included side of a triangle are equal to the corresponding angles and side of the other triangle then the triangles are congruent by ASA congruence criteria.

(a) Assertion and reason both are correct and reason is the correct explanation for the assertion.

(b) Assertion and reason both are correct and reason is not the correct explanation for the assertion.

(c) Assertion is correct but reason is wrong.

(d) Reason is correct but assertion is wrong.

Watch Video Solution

5. Assertion: In ΔABC, $AB = AC$ and $\angle B = 50^\circ$, then $\angle C$ is 50°

Reason : In a triangle, angles opposite to equal sides are equal.

(a) Assertion and reason both are correct and reason is the correct explanation for the assertion.

(b) Assertion and reason both are correct and reason is not the correct explanation for the assertion.

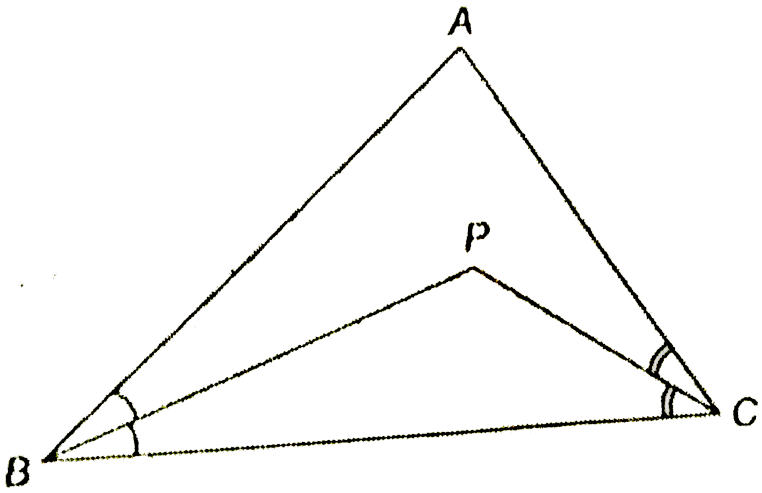
(c) Assertion is correct but reason is wrong.

(d) Reason is correct but assertion is wrong.

Watch Video Solution

Exercise Multiple Choice Questions Comprehension Type

1. In the adjoining figure, $AB > AC$ and the angle bisectors of $\angle B$ and $\angle C$ meet at point P. Prove that $PB > PC$.



A. $PC < PB$

B. $PC > PB$

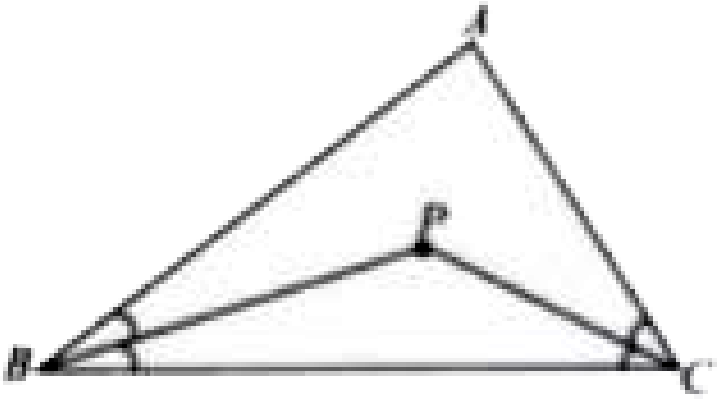
C. $PC = PB$

D. None of these

Answer: A

Watch Video Solution

2. In any triangl, the side opposite to the greater angle is longer.



In ΔABC if $\angle C > \angle B$ then

A. $BC > AC$

B. $AB > AC$

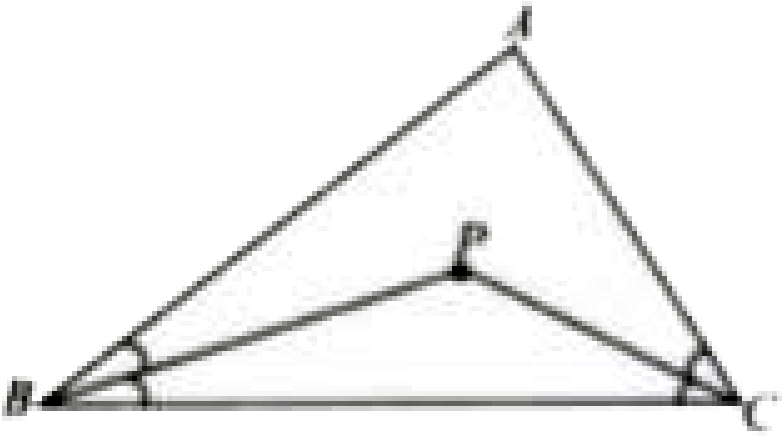
C. $AB < AC$

D. $BC < AC$

Answer: B

Watch Video Solution

3. In any triangl, the side opposite to the greater angle is longer.



In a ΔABC, if $\angle A = 45^\circ, \angle B = 70^\circ$. The largertst side of a triangle is

A. BC

B. AB

C. AC

D. None of these

Answer: C

Watch Video Solution

Exercise Multiple Choice Questions Passage

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

A. isosceles

B. scalene

C. right-angled

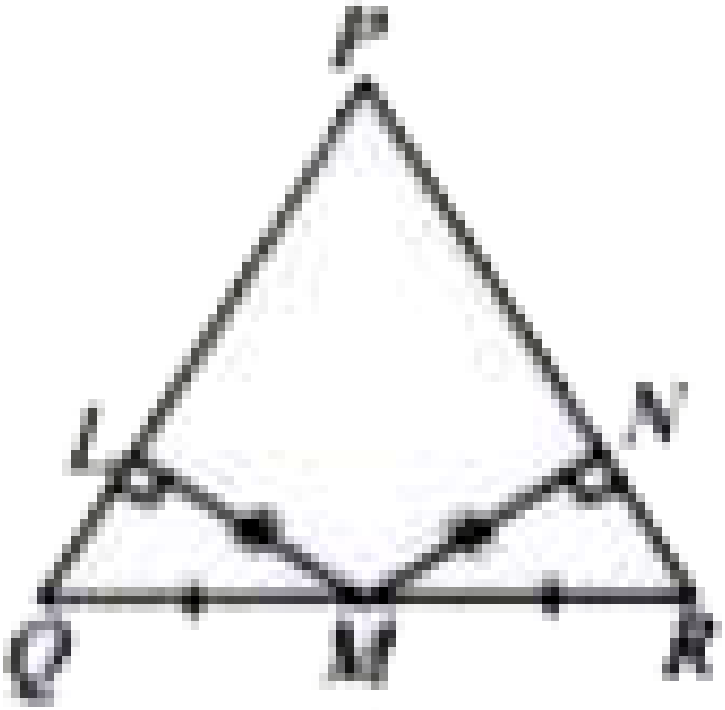
D. equilateral

Answer: A

Watch Video Solution

2. If in two right triangles, the hypotenuse and one side of one triangle are equal to the hypotenuse and one side of the other triangle, then the two triangles are congruent. 1.

In the figure, it is given that $LM = MN, QM = MR, ML \perp PQ$ and $MN \perp PR$. then



A. $PQ < PR$

B. $PQ > PR$

C. $PQ = PR$

D. None of these

Answer: C

Watch Video Solution

3. If in two right triangles, the hypotenuse and one side of one triangle are equal to the hypotenuse and one side of the other triangle, then the two triangles are congruent. 1.

PL is an altitude from P of ΔPQR on QR such that QL = LR. Then,

A. $\angle Q < \angle R$

B. $\angle Q = \angle R$

C. $\angle Q > \angle R$

D. $\angle P = \angle R$

Answer: B

Watch Video Solution

Exercise Subjective Problems Very Short Answer Type

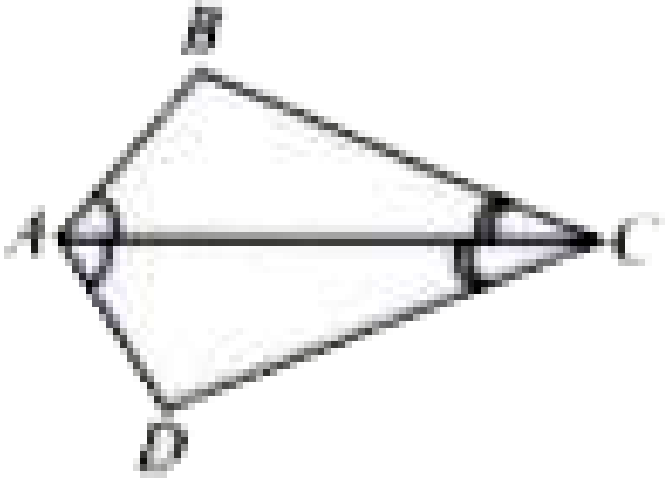
1. In Figure, it is given that $AB = CF, EF = BD$ and $\angle AFE = \angle CBD$. Prove that $AFE \cong CBD$.

Watch Video Solution

2. In Figure, X and Y are two points on equal sides AB and AC of a ABC such that $AX = AY$. Prove that $XC = YB$.

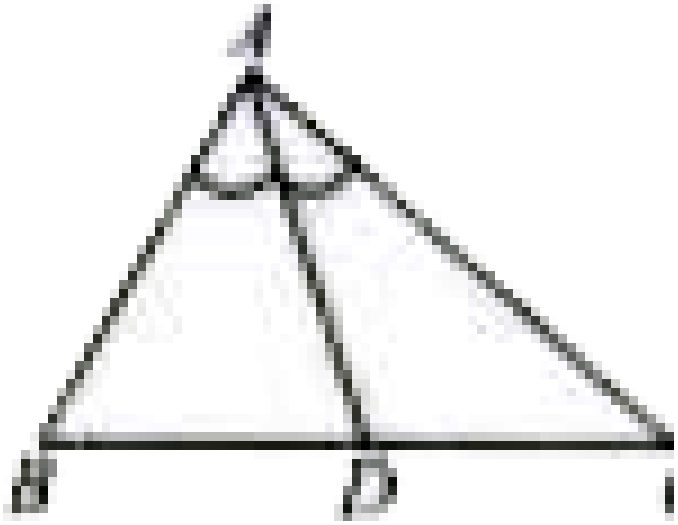
Watch Video Solution

3. In the figure, diagonal AC of a quadrilateral ABCD bisects the angles A and C. Prove that AB = AD and CB = CD.



Watch Video Solution

4. In ΔABC, if AD is the bisector of $\angle A$, show that $AB > BD$ and $AC > DC$.



Watch Video Solution

5. In the figure, AD = BC and BD = CA. Prove that $\angle ADB = \angle BCA$ and $\angle DAB = \angle CBA$.

Watch Video Solution

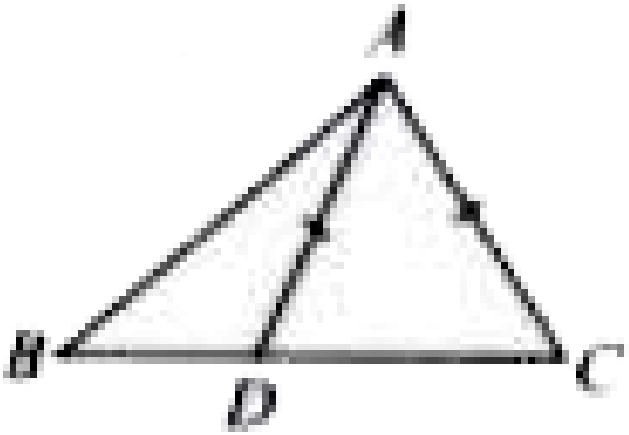
6. In a ΔABC, if $\angle A = 40^\circ$ and $\angle B = 60^\circ$ then which side of the triangle is longest and which is shortest?

Watch Video Solution

7. Is it possible to draw a triangle with sides of length 3 cm, 4 cm and 8 cm?

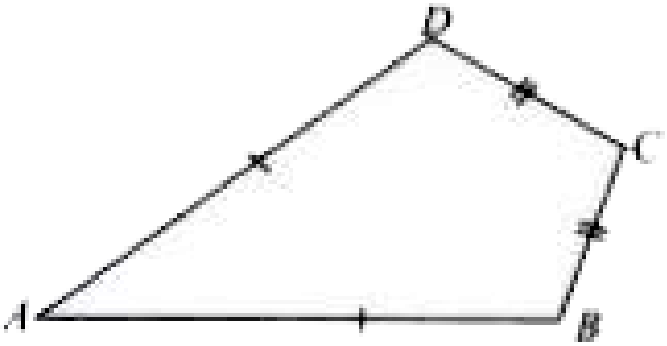
Watch Video Solution

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



Watch Video Solution

9. In quadrilateral ABCD, AB = AD and BC = CD. Show that $\angle ABC = \angle ADC$.



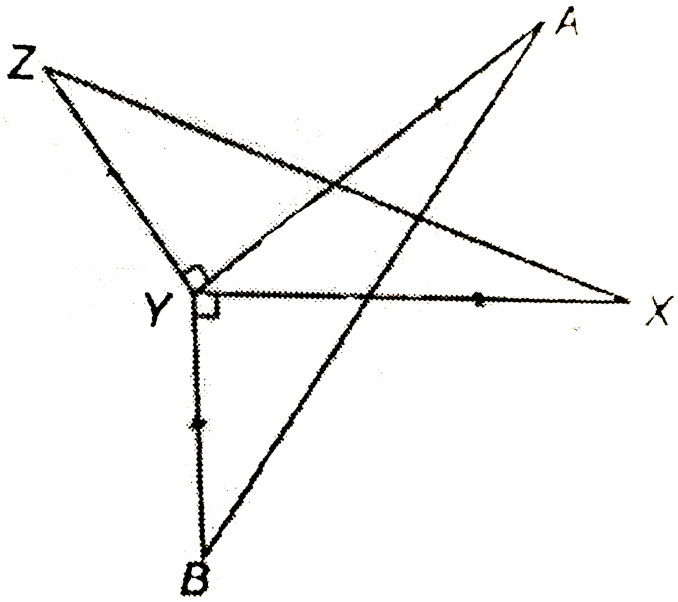
Watch Video Solution

Exercise Subjective Problems Short Answer Type

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

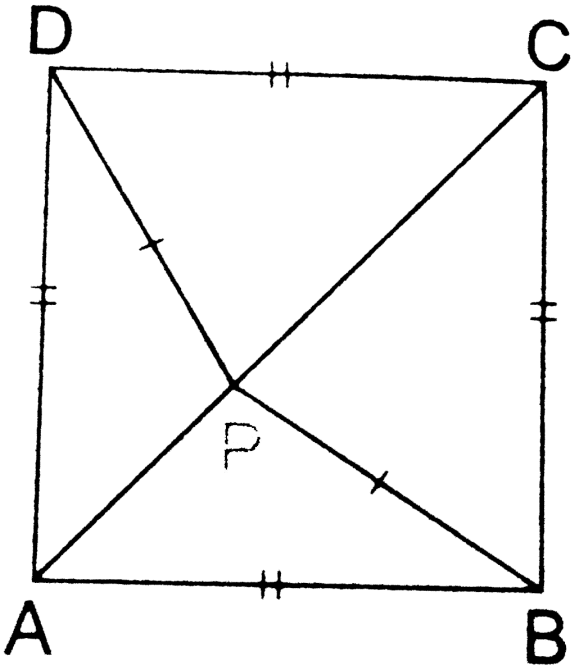
Watch Video Solution

2. In the adjoining figure, $\angle AYZ = \angle BYX = 90^\circ$, $AY = YZ$ and $XY = BY$. Prove that $AB = ZX$.



Watch Video Solution

3. In the given figure, ABCD is a square and P is a point inside it such PB = Pd. Prove that CPA is a straight line.



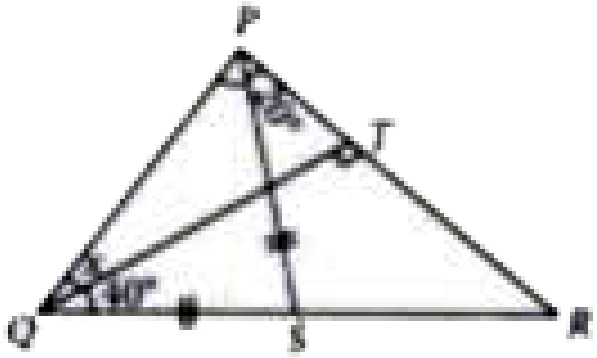
Watch Video Solution

4. AB is a line segment, AX and BY are two equal line segments drawn on opposite sides of line AB such that AX || BY. If AB and XY intersect each other at P, prove that

$\Delta APX \cong \Delta BPY$

Watch Video Solution

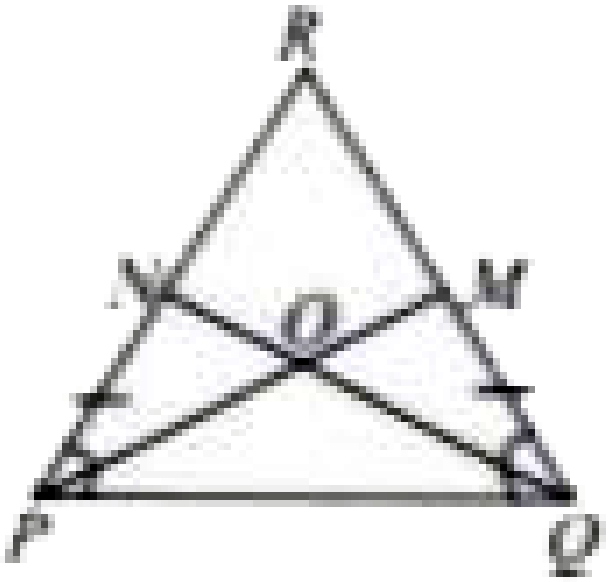
5. In the given figure, $QT \perp PR$ and QS = PS. If $\angle TQR = 40^\circ$ and $\angle RPS = 20^\circ$ then find value of x.



Watch Video Solution

6. In the figure, $\angle QPR = \angle PQR$ and M and N are respectively on sides QR and PR such that QM = PN. Prove that OP=OQ, where

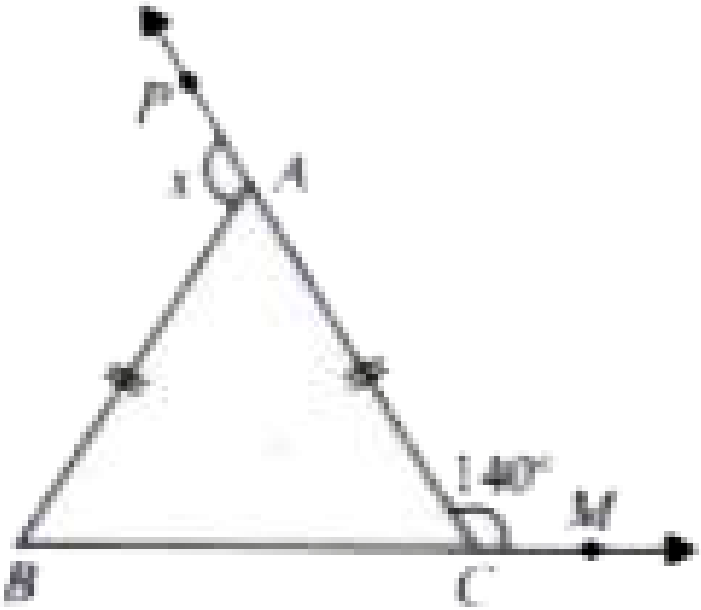
O is the point of intersection of PM and QN.



Watch Video Solution

7. In the figure $AB = AC, \angle ACM = 140^\circ$ and $\angle PAB = x$.

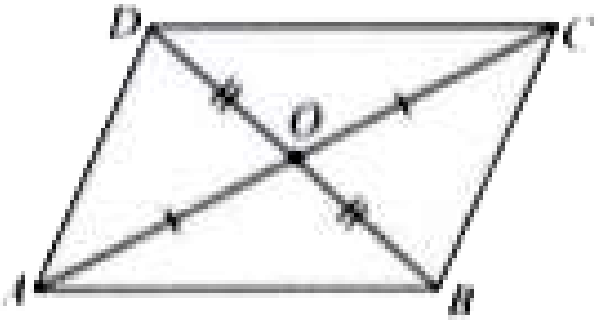
Find the value of x.



Watch Video Solution

8. In the figure, show that

$2(AC + BD) > AB + BC + CD + DA.$



Watch Video Solution

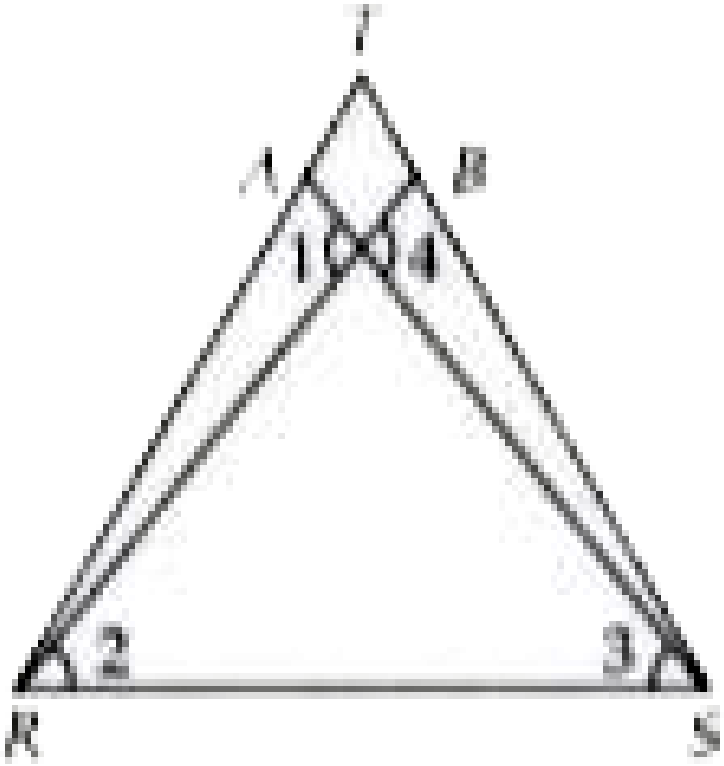
9. In a right angled triangle, one acute angle is double the other.

Prove that the hypotenuse is double the smallest side.

Watch Video Solution

10. In figure, it is given that $RT = TS, \angle 1 = \angle 4$ and $\angle 3 = \angle 2$.

Prove that $\Delta RBT \cong \Delta SAT$.

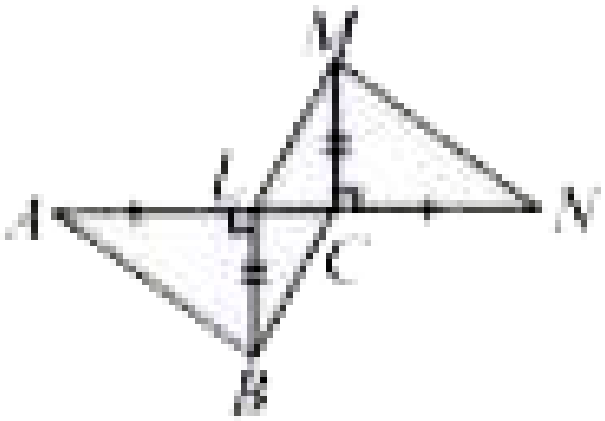


Watch Video Solution

Exercise Subjective Problems Long Answer Type

1. In the figure , $BL \perp AC, MC \perp LN$, AL=CN and BL= CM.

Prove that : $\triangle ABC \cong \triangle NML$



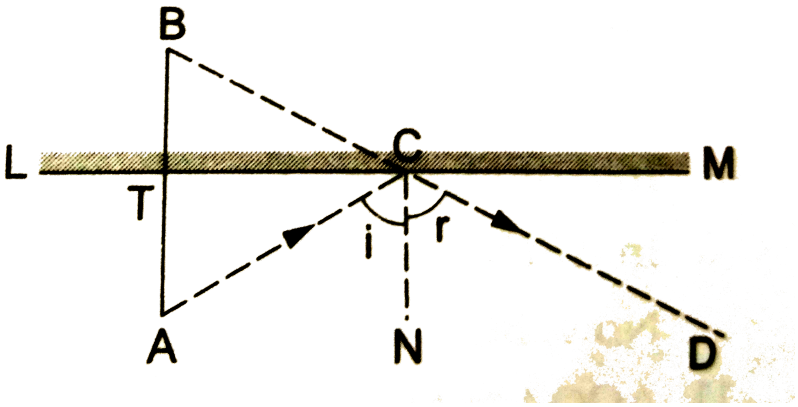
Watch Video Solution

2. If two isosceles triangles have a common base, prove that the line segment joining their vertices bisects the common base at right angles.

Watch Video Solution

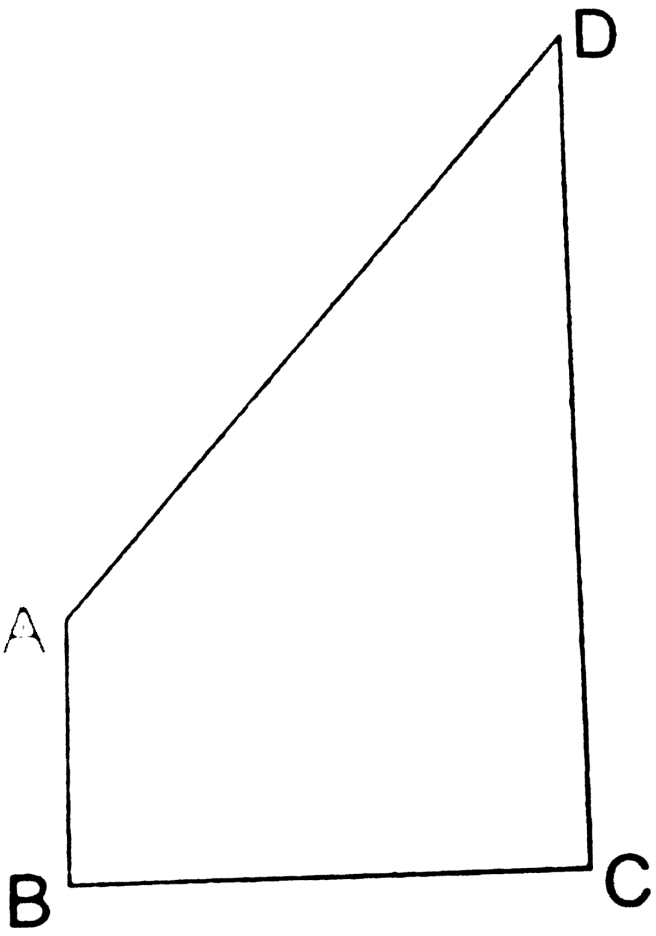
3. The image of an object placed at a point A before a plane mirror LM is seen at the point B by an observer at D, as shown in

the figure. Prove that the image is as far behind the mirror as the object is in front of the mirror.



Watch Video Solution

4. AB and CD are respectively the smallest and largest sides of a quadrilateral ABCD. Show that $\angle A > \angle C$ and $\angle B > \angle C$.



Watch Video Solution

5. In Figure, T is a point on side QR of PQR and S is a point such that $RT = ST$. Prove That : $PQ + PR > QS$

Watch Video Solution

Exercise Subjective Problems Integer Numerical Value Type

1. The vertical angle of an isosceles triangle is 110° . What is value of product of the digits in the measure of one of the equal angles?

Watch Video Solution

2. Congruence of Triangles

Watch Video Solution

3. In ΔABC if $AB = AC$ and $\angle B = 70^\circ$, then $\angle C = 2a^\circ$.

Find the value of a

Watch Video Solution

4. An exterior angle of a triangle is 110°, and one of the interior opposite angle is 30° . Then the other interior angle is K x 40°.

Find K.

Watch Video Solution

5. In $\Delta PQR, \angle R = \angle P$ and $QR = 4cm$ and $PR = 5cm$.

Then find the value of length of $PQ \times QR \times PR$.

Watch Video Solution

Olympaid Hots Corner

1. If ΔABC is an obtuse angled triangle in which $\angle C = 110^\circ$ then which one of the following is true ?

A. $AB = AC$

B. $AB < AC$

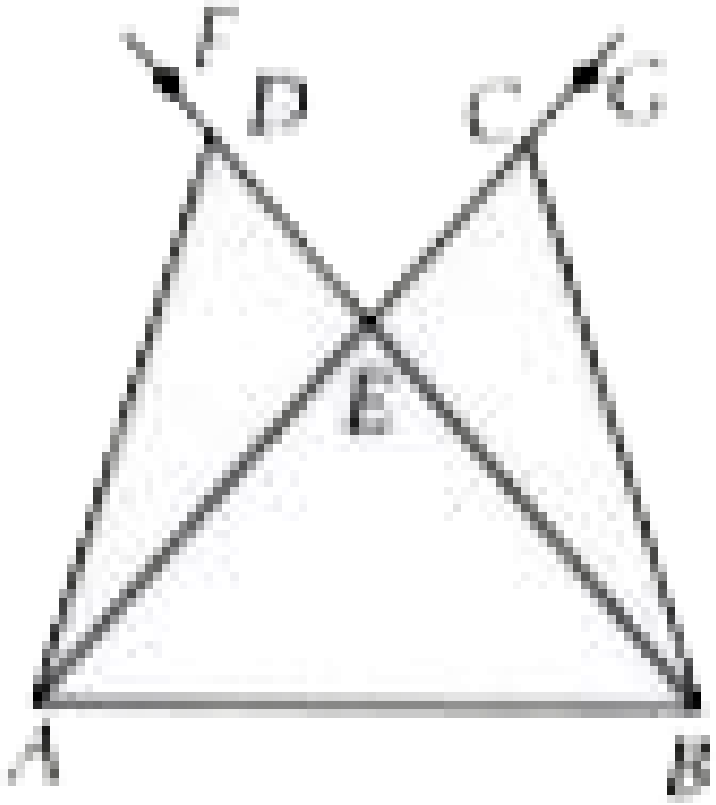
C. $AB > AC$

D. $AB < BC$

Answer: C

Watch Video Solution

2. In the given figure, if ED = EC and $\angle ADF = \angle BCG$, then ΔABE is a/an



A. Equilateral triangle

B. Isosceles triangle

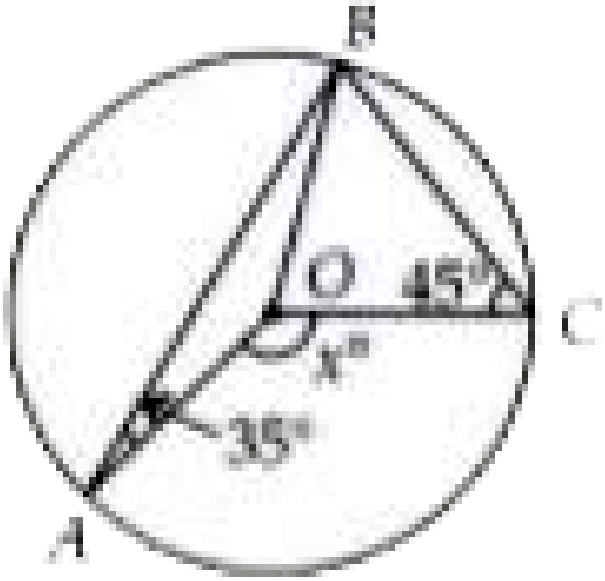
C. Scalene triangle

D. Non-isosceles right angled triangle

Answer: B

Watch Video Solution

3. In the given figure, O is the centre of cirlce. If $\angle BAO = 35^\circ$ and $\angle BCO = 45^\circ$ then the value of x will be



A. 160

B. 170

C. 80

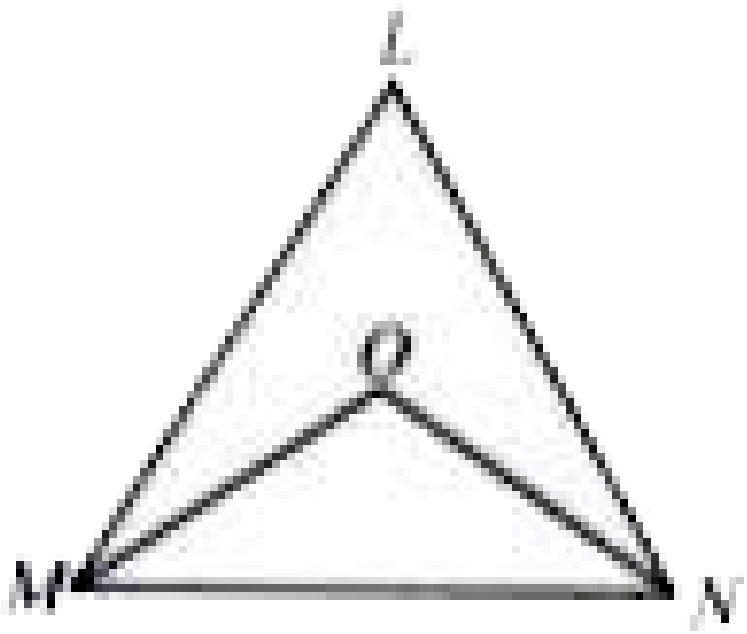
D. 140

Answer: A

Watch Video Solution

4. In the given figure $\angle = 62^\circ$, $\angle NMO = 29.5^\circ$. If MO and NO are bisectors of $\angle LMN$ and $\angle LMN$ respecgively of ΔLMN,

find $\angle ONM$ and $\angle MON$.



A. $27^\circ, 121^\circ$

B. $64^\circ, 32^\circ$

C. $64^\circ, 121^\circ$

D. $29.5^\circ, 121^\circ$

Answer: D

Watch Video Solution

5. From a point O in the interior of a `DeltaABC perpendiculars OD, OE and OF are drawn to the sides BC, CA and AB respectively, then which one of the following is true ?

A. $AB + AC > OB + OC$

B. $AB + BC + CAtOA + OB + OC$

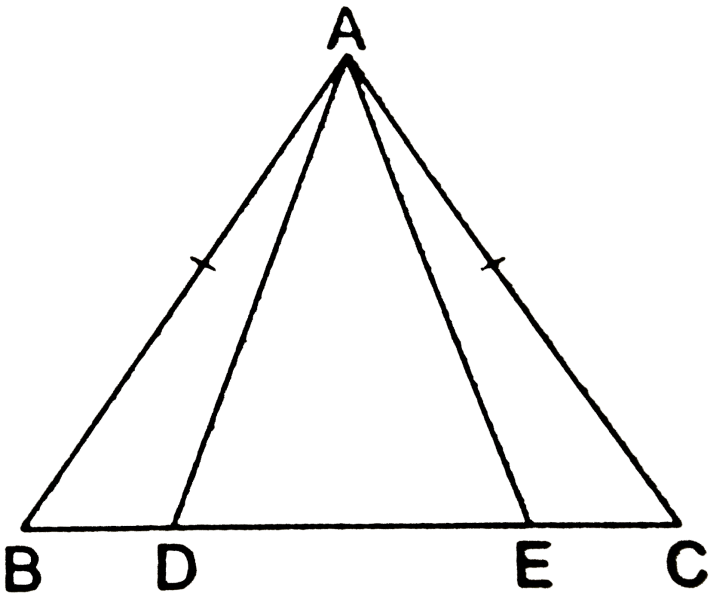
C. $OA + OB + OC > \frac{1}{2}(AB + BC + CA)$

D. None of these

Answer: D

Watch Video Solution

6. In an isosceles ΔABC with AB = AC, D and E are point on BC such that BE = CD. Show that AD = AE.



A. AD=AB

B. AE=DE

C. AD=DE

D. AD=AE

Answer: D

Watch Video Solution

7. If D is the mid-point of the hypotenuse AC of a right triangle ABC, prove that $BD = \frac{1}{2}AC$

A. $\frac{1}{2}AB$

B. $\frac{1}{2}AD$

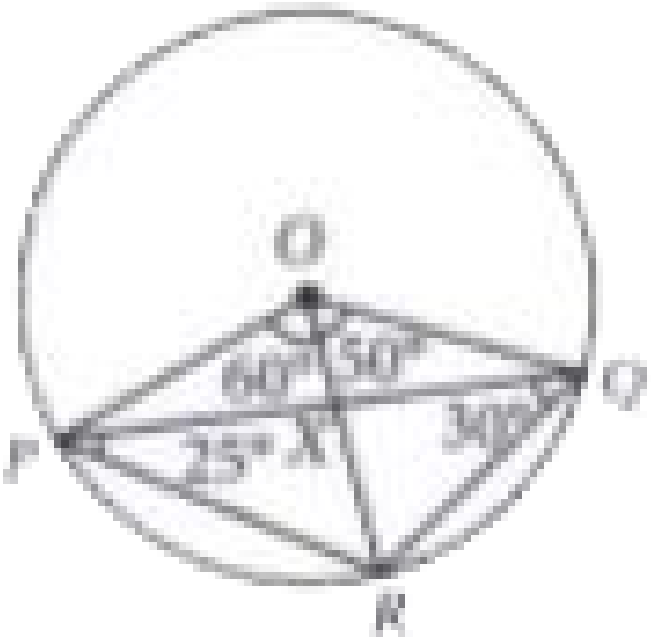
C. $\frac{1}{2}AC$

D. None of these

Answer: C

Watch Video Solution

8. In the given figure, the value of $\angle PXR$ is



A. 85°

B. 100°

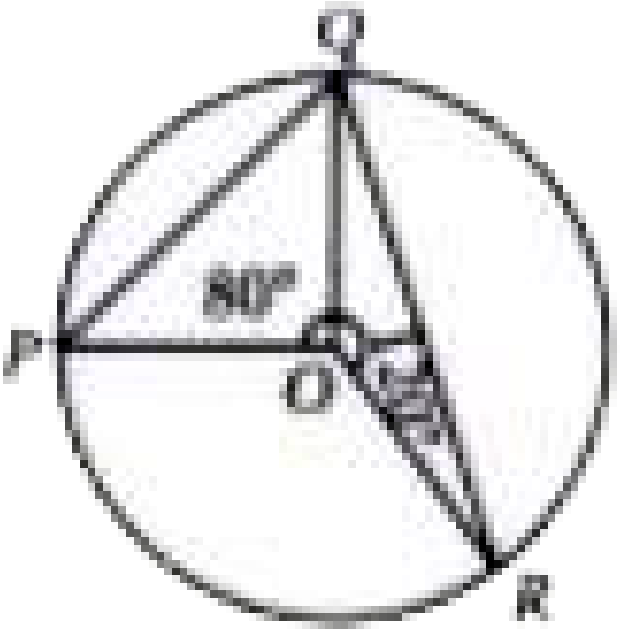
C. 95°

D. 120°

Answer: C

View Text Solution

9. In the given figure, if O is centre of circle, then $\angle PQR$=



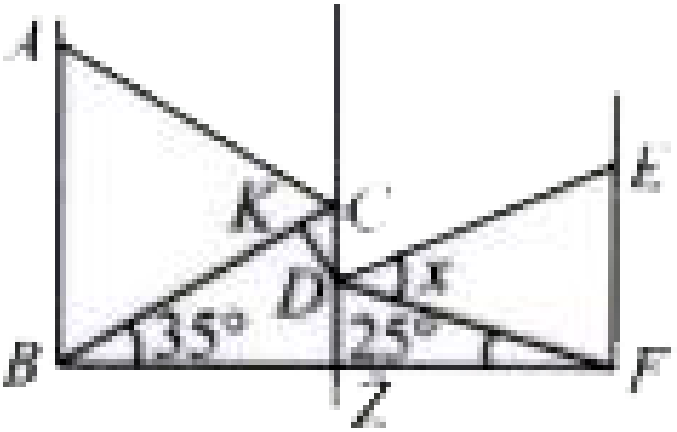
Watch Video Solution

10. In the given figure, it is given that

(i) $AB \perp BF, CZ \perp BF$ and $EF \perp BF$

(ii) AC= BC

(iii) KD is perpendicular to BC and DE.



Find the measure of x.

A. 75°

B. 30°

C. 60°

D. 45°

Answer: C

Watch Video Solution