M A T H E M A T I C S

(DAILY PRACTICE PAPER) [CLASS IX]

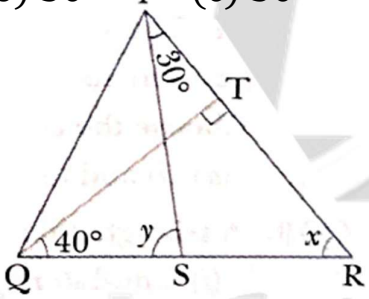
TRIANGLE

Competency Focused Questions (MCQs)

Q1. The measure of each of the base angles of an isosceles triangle whose base angle is double the vertex angle is:
(a) 58° (b) 64° (c) 72° (d) 80°

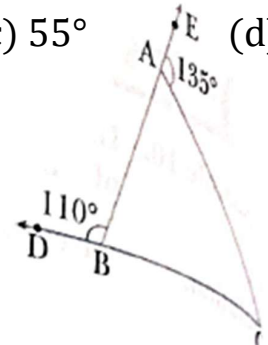
Q2. PQR is a right triangle in which ∠Q = 90°. If ∠P : ∠R = 2 : 3, then measure of least angle is:
(a) 36° (b) 54° (c) 56° (d) 18°

Q3. In figure, if QT ⊥ PR, ∠TQR = 40° and ∠SPR = 30°, the value of y - x is:
(a) 80° (b) 50° (c) 30° (d) 130°

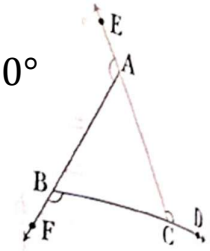


Q4. In a ΔABC, if ∠A - ∠B = 42° and ∠B - ∠C = 21°, then ∠B = ?
(a) 32° (b) 63° (c) 53° (d) 95°

Q5. In the given figure, CB and BA of ΔABC have been produced to D and E respectively such that ∠ABD = 110° and ∠CAE = 135°. Then, ∠ACB = ?
(a) 65° (b) 45° (c) 55° (d) 35°

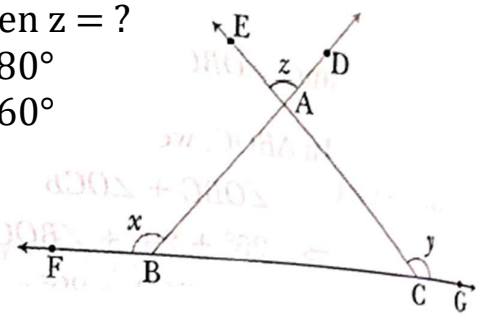


Q6. The sides BC, CA and AB of ΔABC have been produced to D, E and F respectively, then ∠BAE + ∠CBF + ∠ACD = ?
(a) 240° (b) 300° (c) 320° (d) 360°



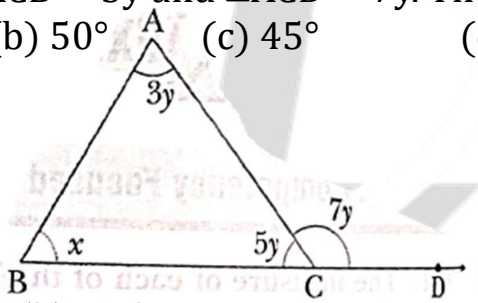
Q7. In the given figure, two rays BD and CE intersect at a point A. The side BC of have been produced on both sides to points F and G respectively. If ∠ABF = x, ∠ACG= y and ∠DAE = z then z = ?

(a) x + y - 180° (b) x + y + 180°
(c) 180° - (x + y) (d) x + y + 360°



Q8. In the given figure, side BC of ΔABC has been produced to a point D. If ∠A ∠B = x, ∠ACB = 5y and ∠ACD = 7y. Then, the value of x is:

(a) 60° (b) 50° (c) 45° (d) 35°



CBE I(b). Select Response Questions (MCQs)

Q9. Which of the following statement/ statements is/are true for any triangle?

(i) All sides are equal.
(ii) It has exactly two acute angles.
(iii) The sum of the angles is always 180°.
(iv) The longest side is always twice the shortest side.

Choose the correct option from the following:

(a) (i) and (ii) (b) (i) and (iv)
(c) Only (iii) (d) (iii) and (iv)

Q 10. A triangle that has one angle greater than 90° is called:

(i) Equilateral triangle (ii) Acute triangle
(iii) Right triangle (iv) Obtuse triangle

Q 11. In the given figure, OB and OC are the angle bisectors of ∠ABC and ∠ACB respectively.
Which of the following statements are true?

(i) The value of x + y is 40°.
(ii) The value of m is 100°.
(iii) The value of x + y is 50°.
(iv) The value of m is 80°

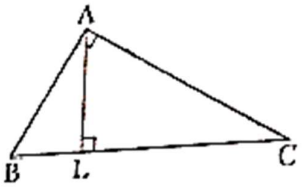
Choose the correct option from the following:

(a) Only (1) (b) Only (ii)
(c) (iii) and (iv) (d) Only (iii)

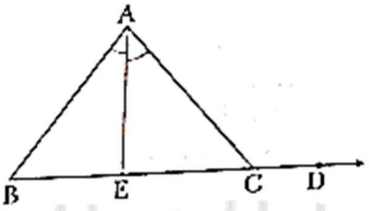
CBE II. Short Answer Questions (Constructed Response Questions)

Q 12. In a ΔABC, ∠A - ∠B = 33° and ∠B –∠C = 18°. Find the angles of the triangle.

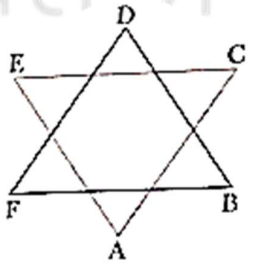
Q 13. A ΔABC is right angled at A and L is a point on side BC such that AL ⊥ BC. Prove that ∠BAL = ∠ACB.



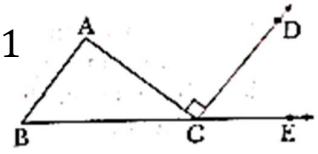
Q 14. The side BC of ΔABC is produced to D. The Bisector of ∠A meets BC at E. Prove that ∠ABC + ∠ACD = 2∠AEC.



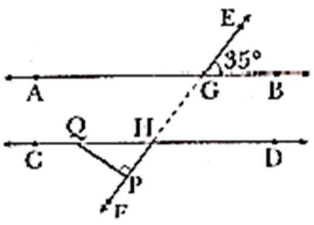
Q 15. In the adjoining figure, show that ∠A + ∠B + ∠C + ∠D + ∠E + ∠F = 360°.



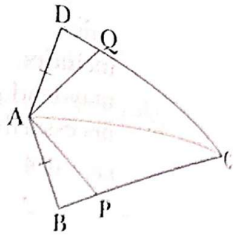
Q 16. In a ΔABC, it is given that ∠A : ∠B : ∠C = 3: 2 : 1 andCD ⊥ AC. Find ∠ECD.



Q 17. In the given figure, AB || CD and EF is a transversal, cutting them at G and H respectively. If ∠EGB = 35° and QP ⊥ EF, find the measure of ∠PQH.



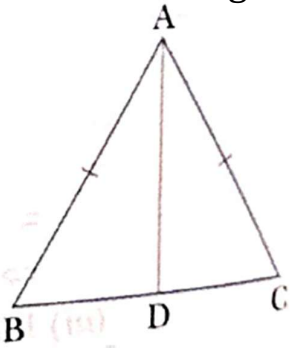
18. In the adjoining figure, AB = AD, ∠BAP = ∠DAQ and ∠PAC = ∠QAC. Prove that AP = AQ.



CBE I(a). Competency Focused Questions (MCQs)

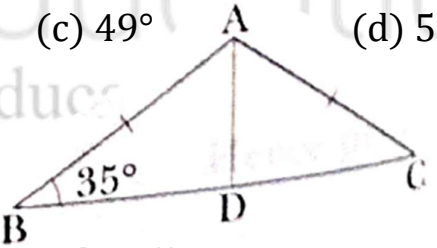
19. In the triangle ABC, AD is the bisector of ∠A, and AB = AC. Which option correctly completes the statement given below? By _____ congruency criteria, ΔABD ≅ ΔACD and using CPCT, we get ∠ABD = _____.

(a) ASA; ∠ADB (b) SAS; ∠ACD
(c) ASA; ∠ADC (d) SAS; ∠ADC



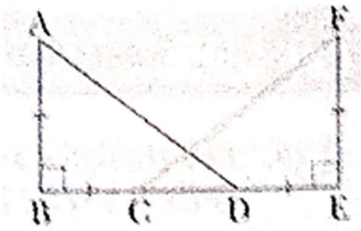
20. In the given figure, if AD is the median, then ∠BAD is:

(a) 32° (b) 38° (c) 49° (d) 55°



Q21. In the adjoining figure, AB || BE and FE || BE.
If AB = FE and BC = DE, then

(a) ABD ~ EFC
(c) ABD ~ ECE
(b) ABD ~ FEC
(d) ABD ~ CEF



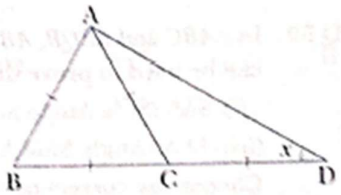
Q22. In the adjoining figure, AC = BD. If ∠CAB = ∠DBA, then ∠ACB is equal to

(a) ∠RAD (b) ∠ABC
(c) ∠ABD (d) ∠BDA

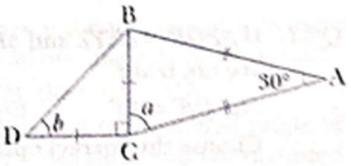
Q23. In ΔABC and ΔPQR, AB = AC, ∠C = ∠P and ∠B = ∠Q. The two triangles are:
(a) isosceles but not congruent
(b) isosceles and congruent
(c) congruent but isosceles
(d) neither congruent nor isosceles

Q24. In triangles ABC and DFE, AB = FD and ∠A = ∠D. The two triangles will be congruent by SAS axiom if:
(a) BC = EF
(b) AC = DE
(c) AC = EF
(d) BC = DE

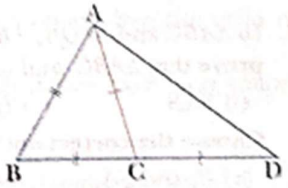
Q25. In the given figure, the measurement of x is:
(a) 15° (b) 20°
(c) 30° (d) 40°



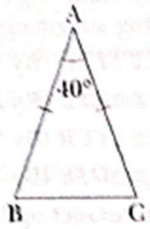
Q26. In the given figure, the value of a + b is:
(a) 110° (b) 120°
(c) 130° (d) 150°



Q27. In the given figure, AB = BC and AC = CD. Then ∠BAD : ∠ADB =
(a) 1 : 1 (b) 3 : 1
(c) 1 : 3 (d) 1 : 2



Q28. In ΔABC, ∠A = 40°, AB = AC.
Then ∠B : ∠C =
(a) 1 : 1 (b) 1 : 2
(c) 2 : 1 (d) 1 : 3



CBE I(b). Select Response Questions (MCQs)

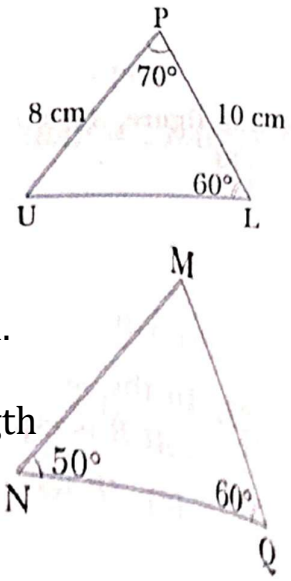
Q29. Two triangles are shown. The perimeter of ΔPUL is 30 cm. Are the triangles congruent?
(i) Yes, as on calculating the missing angle in each triangle it can be

concluded that the triangles are congruent by AAA criteria.

(ii) No, as the missing angle in each triangle cannot be calculated.

(iii) Conclusion about the congruency of triangles can be made provided the length of the side NQ of triangle MNQ is known.

(iv) Conclusion about the congruency of triangles can be made provided the length of the side MN or side MQ of triangle MNQ is known.



Choose the correct option from the following:

(a) (i) and (iv) (b) (ii) and (iii)
(c) (iii) and (iv) (d) None of the above

Q30. In ΔABC and ΔPQR, AB = PQ, ∠A = ∠P and ∠B = ∠Q, which of the following criteria can be used to prove that ΔABC ≅ ΔPQR ?

(i) SAS (Side Angle Side) (ii) AAS (Angle Angle Side)
(iii) ASA (Angle Side Angle) (iv) AAA (Angle Angle Angle)

Choose the correct option from the following:

(a) (i) and (iv) (b) (ii) and (iii)
(c) (iii) and (iv) (d) None of the above

Q31. If ΔPQR ≅ ΔXYZ and ΔPQR is not congruent to ΔZXY. Then which of the following is are not true?

(i) QR = XY (ii) PR = XZ
(iii) PQ = XY (iv) YZ = QR

Choose the correct option from the following:

(a) Only (ii) (b) (ii) and (iv)
(c) Only (i) (d) (iii) and (iv)

Q32. In ΔABC and ΔPQR, ∠B = ∠Q, AB = PQ and BC = QR. Which criteria can be used to prove that ΔABC and ΔPQR are congruent?

(i) SAS (ii) ASA (iii) AAS (iv) AAA

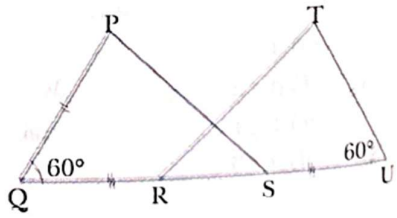
Choose the correct option from the following:

(a) (i) and (ii) (b) Only (i)

(c) (iii) and (iv) (d) (i), (ii), (iii) and (iv)

Q33. In the given figure, if PQ = TU, QR = SU and ∠PQS = 60° = ∠TUR. Then which of the following statement/statements is/are true?

(i) ΔPQS ≅ ΔTRU (By SAS)
(ii) ΔPQS ≅ ΔRTU (By ASA)
(iii) ΔPQS ≅ ΔTUR (By SAS)
(iv) ΔPQS ≅ ΔUTR (By ASA)



Choose the correct option from the following:

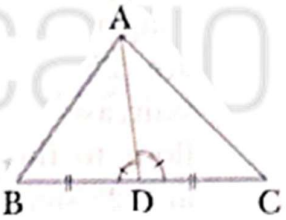
(a) (i) and (ii) (b) (i) and (iii)
(c) (i) and (iv) (d) Only (ii)

II. Competency Focused & Inference Based Questions (A-R)

The following questions are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

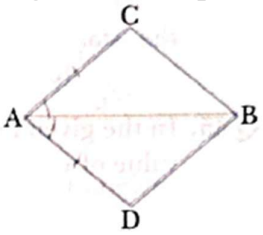
(a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

Q34. Assertion (A): In ΔABD and ΔACD, given
AD = AD, BD = CD
∠ADB = ∠ADC
∴ ΔABD ≅ ΔACD [By SAS congruency rule]
⇒ AB = AC



Reason (R): Corresponding parts of congruent triangles are equal.

Q35. Assertion (A): In quadrilateral ACBD, AC = AD and AB bisects ∠A, then ΔABC ≅ ΔABD.
Reason (R): ΔABC ≅ ΔABD, by AAS congruence rule.



Q36. Assertion (A): In two triangles ABC and PQR, AB = PQ, BC = QR and ∠B = ∠Q, then ΔABC ≅ ΔPQR.
Reason (R): Two triangles are congruent if two sides and one angle of a triangle are equal to corresponding two sides and

one angle of other triangle.

Q37. Assertion (A): In ΔABC, AM ⊥ BC such that BM = CM, then ∠A = ∠B.
Reason (R): Two triangles are congruent if two sides and the included angle of one triangle are equal to corresponding two sides and the included angle of other triangle.

Q38. Assertion (A): If two triangles are congruent to each other, then the ratio of the corresponding sides is 1: 1.
Reason (R): Two triangles are congruent if and only if they have same shape and size.

Q39. Assertion (A): If ΔABC ≅ ΔRPQ, then BC = QR.
Reason (R): Corresponding parts of two congruent triangles are equal.

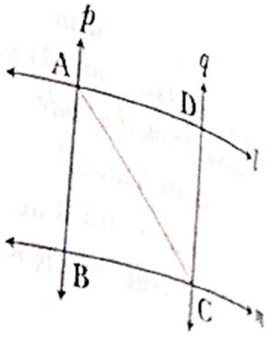
III. Short Answer Questions (Constructed Response Questions)

Q40. 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. **[NCERT Exemplar]**

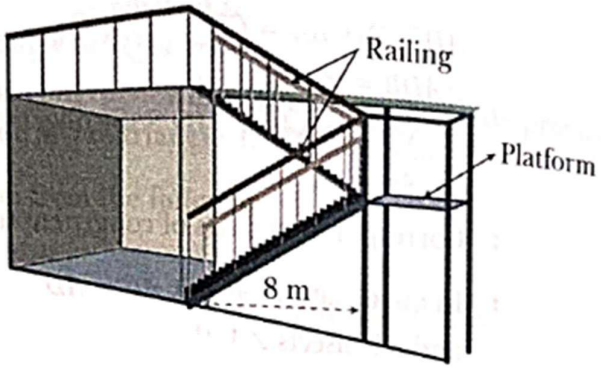
Q41. O is a point in the interior of a square ABCD such that COD is an equilateral triangle. Show that AOB is an isosceles triangle. **[NCERT Exemplar]**

Q42. ABC is a right triangle such that AB = AC and bisector of angle C intersects the side at D. Prove that AC + AD = BC.

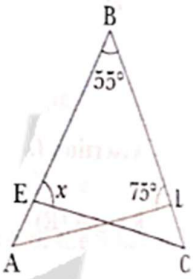
Q43. l and m are two parallel lines intersected by another pair of parallel lines p and q (see figure). Show that ΔABC ≅ ΔCDA. **[NCERT Exemplar]**



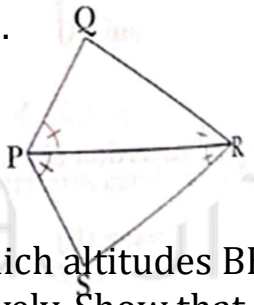
Q44. The picture below shows a staircase outside a house. Each step of the staircase's congruent and there are 25 steps in the staircase from the floor to the platform and 25 steps from the platform to the roof. What is the length of the staircase railing? **[CFQ by CBSE]**



Q45. In the given figure, if AB = BC and ∠A = ∠C, then find the value of x.

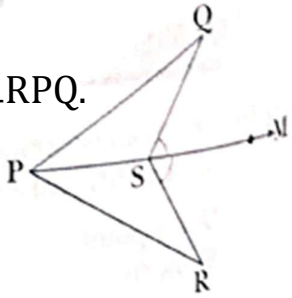


Q46. In the given figure, diagonal PR of quadrilateral PQRS bisects the angles P and R. Prove that PQ = PS and RQ = RS.



Q47. ABC is an isosceles triangle with AB = AC, in which altitudes BE and CF are drawn to equal sides AC and AB respectively. Show that these altitudes are equal.

Q48. In the given figure, ∠QSM = ∠RSM and PM bisects ∠RPQ.



Q 62. The angles of a triangle are in the ratio 3 : 5 : 7. The smallest angle of the triangle is:

(a) 12° (b) 36° (c) 60° (d) 84°

[CFQ by CBSE]

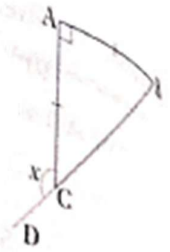
Q 63. ΔABC is an isosceles triangle with AB = AC. If the vertex angle is twice the sum of the base angles, then the vertex angle of the triangle is:

(a) 30° (b) 120° (c) 60° (d) none of these

Q 64. In ΔABC, $AB = AC$ and $\angle B = 50°$, then $\angle C$ is equal to:
(a) 40° (b) 50° (c) 80° (d) 130°

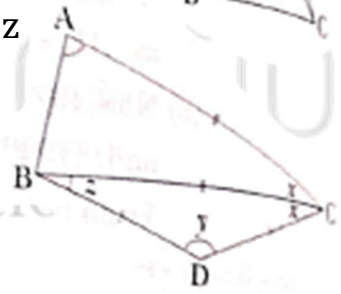
Q 65. In ΔPQR, $\angle R = \angle P$, QR = 4 cm and PR = 5 cm. Then the length of PQ is:
(a) 4 cm (b) 5 cm (c) 2 cm (d) 2.5 cm

Q 66. In the given figure, if the measure of exterior angle ACD is x, then the value of x is:
(a) 100° (b) 135°
(c) 140° (d) 150°

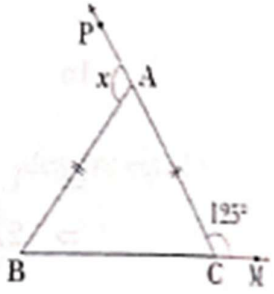


Q 67. In figure, $AB = AC$, $CH = CB$ and $HK \parallel BC$. If $\angle CAX = 137°$, then $\angle CHK$ equals:
(a) 68.5° (b) 43°
(c) 137° (d) 58.5°

Q 68. In the given figure, $\angle BAC = 79°$, $CA = CB$ and $BD = CD$. The measures of x, y and z respectively are:
(a) 25°, 130°, 25°
(b) 45°, 90°, 45°
(c) 54°, 72°, 54°
(d) 22°, 136°, 22°



Q 69. In figure, $AB = AC$, $\angle ACM = 125°$ and $\angle PAB = x$. The value of x is:
(a) 130° (b) 110°
(c) 100° (d) 120°

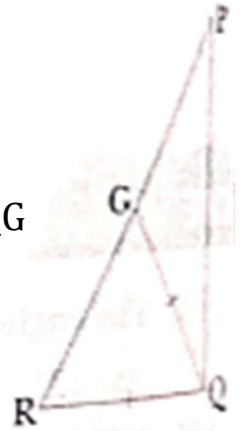


Q 70. In the figure shown, G is a point on PR and QG = QR. Which option shows the correct steps to find the relationship between $\angle QPR$ and $\angle QRP$?

(a) Step-1: $\angle QRG = \angle QGR$
Step-2: $\angle QPG + \angle PQG = \angle QGR$
Step-3: $\angle QPG + \angle PQG = \angle QRG$
Step-4: $\angle QPR < \angle QRP$

(b) Step-1: $\angle RQG = \angle QGR$
Step-2: $\angle QPG + \angle PQG = \angle QGR$
Step-3: $\angle QPG + \angle PQG = \angle RQG \Rightarrow \angle QPG < \angle RQG$
Step-4: $\angle QPR < \angle QRP$

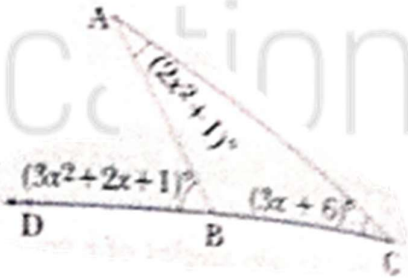
(c) Step-1: As $QG = QR$, $RQ < PQ$
Step-2: $\angle QPG > \angle RQG$
Step-4: $\angle QPR < \angle QRP$



(d) Step-1: As $QG = QR$, $\angle QRG = \angle QGR$
Step-2: $\angle QPG + \angle PQG = \angle QGR$
Step-3: $\angle QPG + \angle PQG = \angle QRG \Rightarrow \angle QPG < \angle QRG$
Step-4: $\angle QPR > \angle QRP$

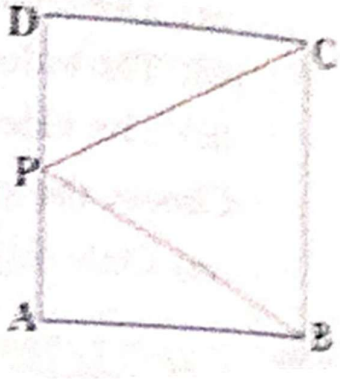
Q 71. P is a point on the bisector of $\angle ABC$. If the line through P, parallel to BA meets BC Q, prove that BPQ is an isosceles triangle.

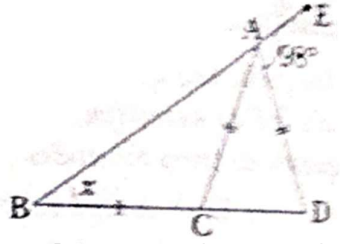
Q 72. In the given figure, $\angle ABD$ is an exterior angle of ΔABC.
(i) Find the value of x.
(ii) Find the measure of $\angle ABC$.
[CFQ by CBSE]



Q 73. In ΔABC, AD is the perpendicular bisector of BC. Show that ΔABC is isosceles in which $AB = AC$.

Q 80. In the adjoining figure, ABCD is a square and P is mid-point of AD, BP and CP are joined. Prove that $\angle PBC = \angle PCB$.





Q 81. In the adjoining figure, find the value of x.

Q 82. In ΔABC, AB = AC and D is a point on AB such that AD = DC = BC. Show that ∠BAC = 36°.

Q 83. ABCD is a square and ABE is an equilateral triangle outside the square, prove that ∠ACE = 1/2 ∠ABE.

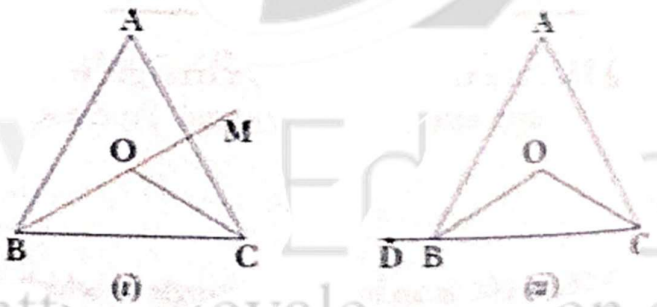
CBE V. Long Answer Questions (Constructed Response Questions)

Q 84. (a) In the figure (i), bisectors of ∠B and ∠C of an isosceles triangle ABC with AB = AC intersect each other at O. BO is produced to a point M. Prove that ∠MOC = ∠ABC.

[NCERT Exemplar]

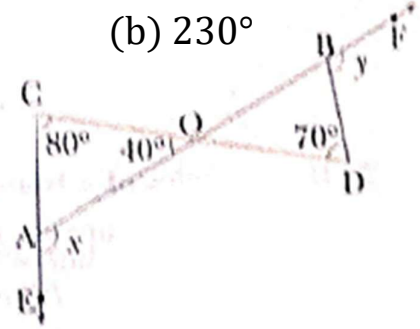
(b) In the figure (ii), bisectors of ∠B and ∠C of an isosceles triangle ABC with AB = AC intersect each other at O. Show that the external angle adjacent to ∠ABC is equal to ∠BOC.

[NCERT Exemplar]



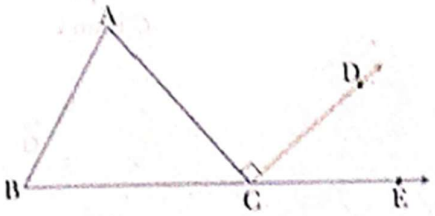
Q1. In the given figure, lines AB and CD intersect at a point O. The sides CA and OB have been produced to E and F respectively such that ZDAE = x and ZDBF = y.
If ZOCA = 80°, ZCOA = 40° and ZBDO = 70°, then x + y = ?

(a) 190° (b) 230° (c) 210° (d) 270°



Q2. In a AABC, it is given that ZA: ZB:ZC= 3:2:1 and ZACD = 90°. If BC is extended to E, then ZECD = ?

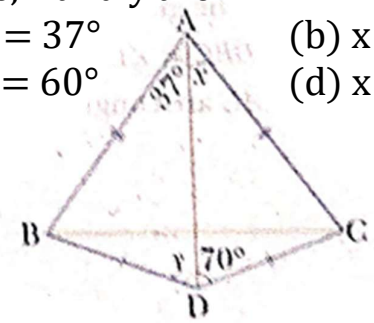
(a) 60° (b) 50° (c) 40° (d) 25°



Q3. In the given figure, x and y are:

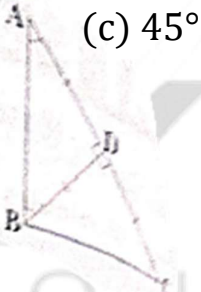
(a) x = 70°, y = 37° (b) x = 37°, y = 70°

(c) x = 47°, y = 60° (d) x = 60°, y = 47°



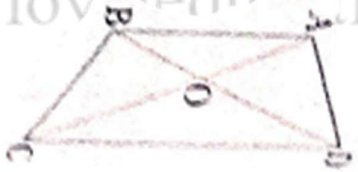
Q 4. In the given figure, BD ⊥ AC, the measure of ∠ABC is:

(a) 60° (b) 30° (c) 45° (d) 90°



Q 5. ABCD is a quadrilateral in which AD = BC and ∠DAB = ∠CBA. If ∠CAB = 30°, then the measure of ∠AOB is:

(a) 80° (b) 100° (c) 120° (d) 135°



Q 6. It is given that ΔABC ≅ ΔFDE in which AB = 5 cm, ∠B = 40° and ∠A = 80°, then which of the following is true?

(a) ∠D = 60° (b) ∠E = 60°

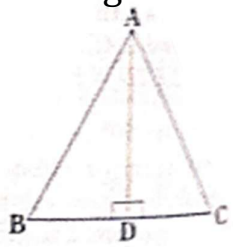
(c) ∠F = 60° (d) ∠D = 8P

Q 7. If the angles of a triangle are (x - 40°), (x - 20°) and (x/2 -10°), then find the value of x. Give your answer in degrees.

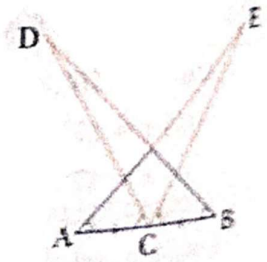
Q 8. If AB = QR, BC = PR and CA = PQ, then ΔCBA is congruent to _____.

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

[NCERT]

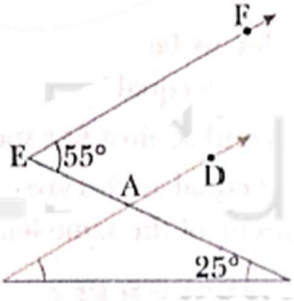


Q 10. In the given figure, AC = BC, ∠DCA = ∠ECB and ∠DBC = ∠EAC. Prove that triangles DBC and EAC are congruent, and hence show that DC = EC.

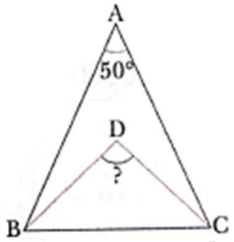


OR

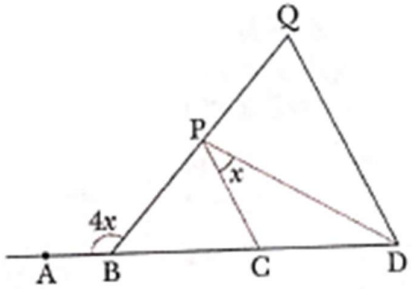
In the given figure, BD || EF, ∠AEF = 55° and ∠ACB = 25°, find ∠ABC.



Q 11. In the figure below, the bisectors of angles B and C of a triangle ABC intersect each other at the point D and ∠A = 50°. Find the value of ∠BDC.



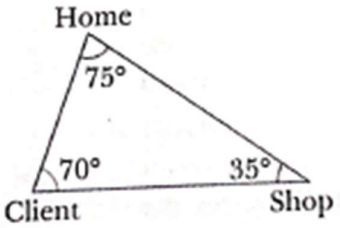
OR



In the given figure, AD and BQ are straight lines. BP = BC and DQ || CP. If ∠ABP = 4x and ∠CPD = x, prove that

(i) CP = CD. (ii) DP bisects ∠CDQ.

Q 12. In a toy game, a robot starts from Home, picks an object from the Shop, delivers it to the client and goes back Home.



* * * * * * * * * * * * * * *