MATHS

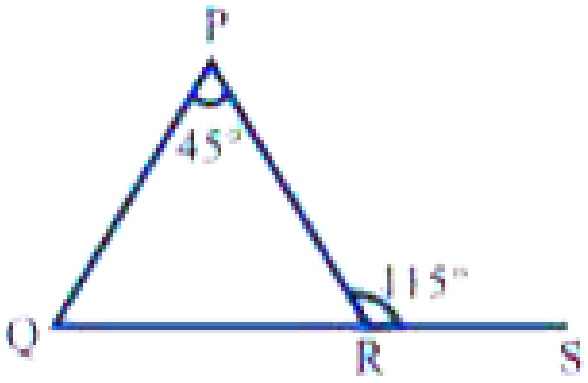
BOOKS - NCERT EXEMPLAR

TRIANGLES

Examples

1. In Fig. 6.1, side QR of a ΔPQR has been produced to the point S. If $\angle PRS = 115^{\circ}$ and

$\angle P = 45^\circ$,then $\angle Q$ is equal to,



A. 70°

B. 105°

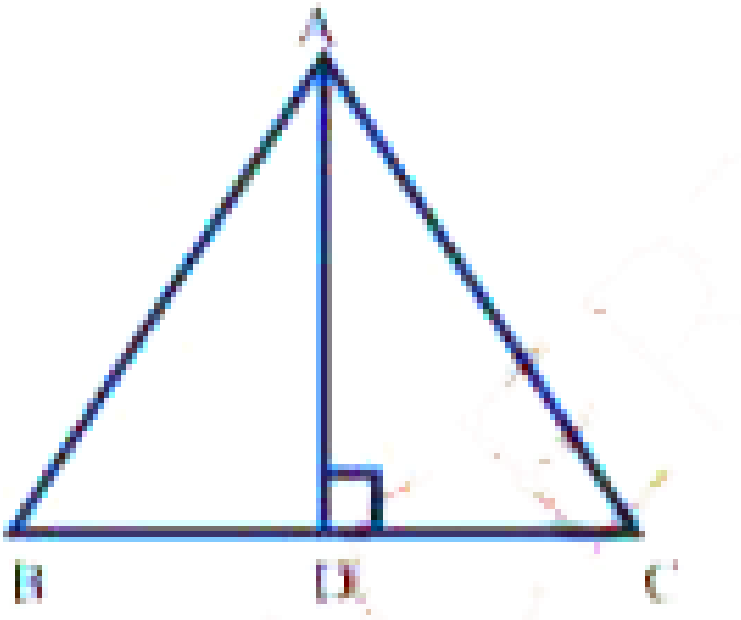
C. 51°

D. 81°

Answer: A

Watch Video Solution

2. In an equilateral triangle ABC (Fig. 6.2), AD is an altitude. Then $4AD^2$ is equal to



A. $2BD^2$

B. BC^2

C. $3AB^2$

D. $2DC^2$

Answer: C

Watch Video Solution

3. Which of the following cannot be the sides of a triangle?

A. 3 cm, 4 cm, 5 cm

B. 2 cm, 4 cm, 6 cm

C. 2.5 cm, 3.5 cm, 4.5 cm

D. 2.3 cm, 6.4 cm, 5.2 cm

Answer: B

Watch Video Solution

4. Which one of the following is not a criterion for congruence of two triangles?

A. ASA

B. SSA

C. SAS

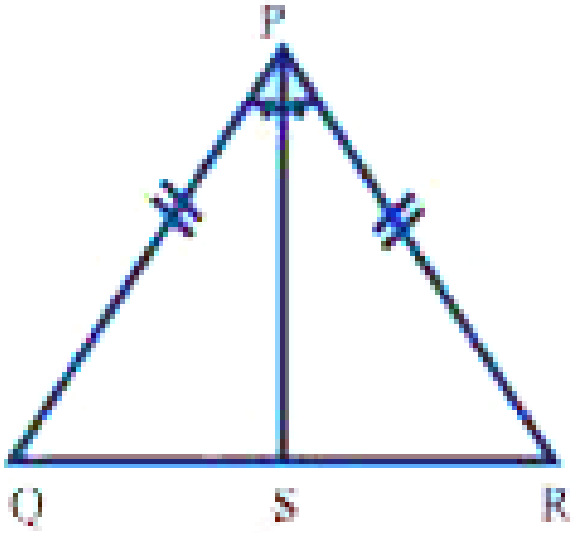
D. SSS

Answer: B

Watch Video Solution

5. In Figure, PS is the bisector of $\angle P$ and $PQ = PR$. Then ΔPRS and ΔPQS are congruent by the

criterion



A. AAA

B. SAS

C. ASA

D. Both b and c

Answer: B

Watch Video Solution

6. The line segment joining a vertex of a triangle to the mid-point of its opposite side is called its _____.

A. SIDES

B. ANGLE

C. MEDIAN

D. ALTITUTE

Answer: C

 Watch Video Solution

7. A triangle is said to be _____, if each one of its sides has the same length.

A. ISOSCELES

B. EQUILATERAL

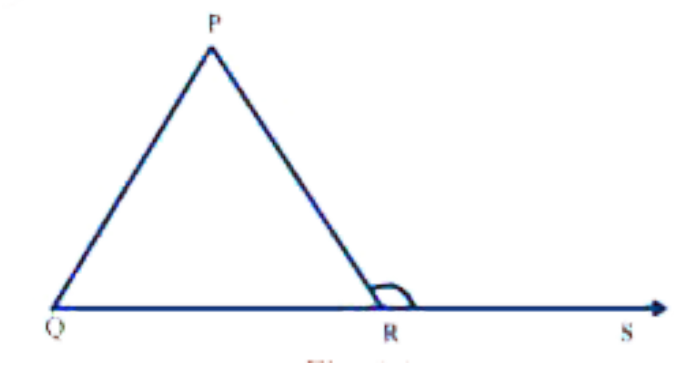
C. SCALENE

D. NONE

Answer: B

Watch Video Solution

8. In Fig. 6.4, $\angle PRS = \angle QPR + \angle$_____



Watch Video Solution

9. Let ABC and DEF be two triangles in which AB = DE, BC = FD and CA = EF. The two triangles are congruent under the correspondence

$ABC \leftrightarrow$ _____

Watch Video Solution

10. Sum of any two sides of a triangle is not less than the third side

Watch Video Solution

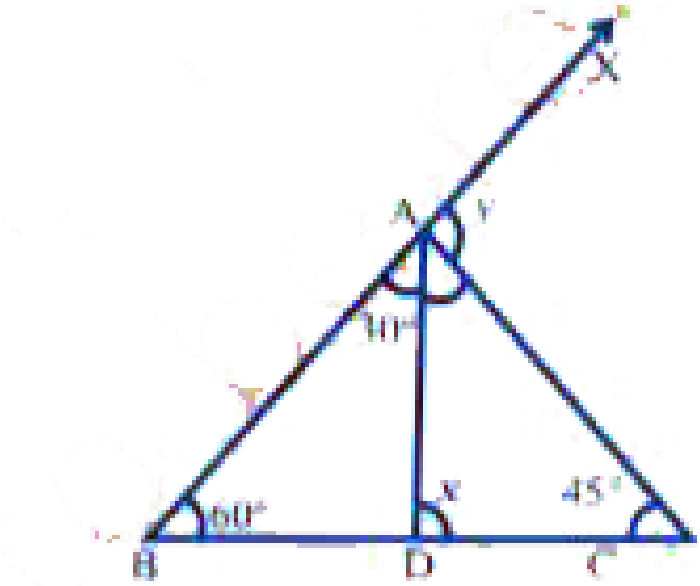
11. The measure of any exterior angle of a triangle is equal to the sum of the measures of its two interior opposite angles

Watch Video Solution

12. If in ΔABC and $\Delta DEF, AB = DE, \angle A = \angle D$ and $BC = EF$ then the two triangle ABC and DEF are congruent by SAS criterion.

Watch Video Solution

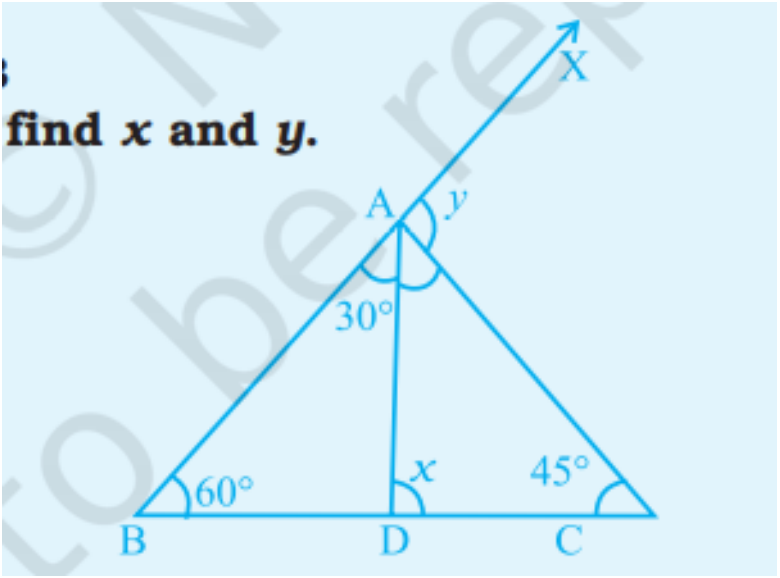
13. In Fig.6.5 Find x and y.



Watch Video Solution

Think And Discuss

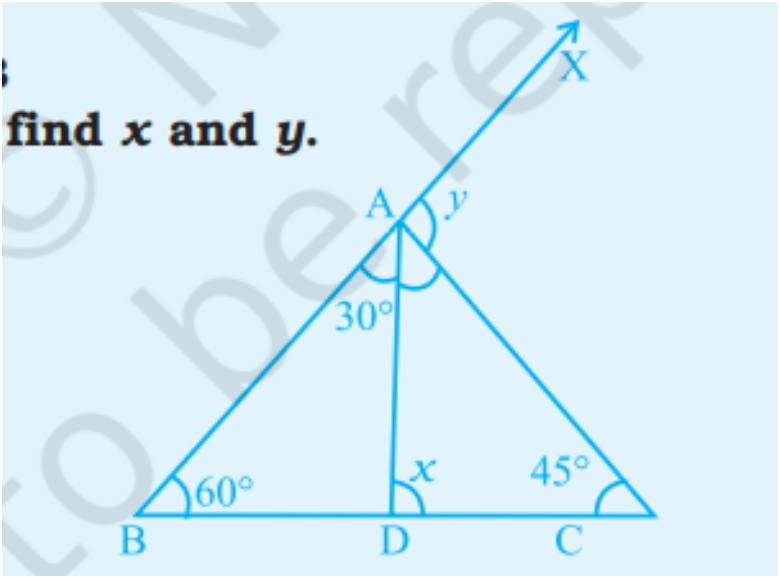
1.



If AD = DC? Why?

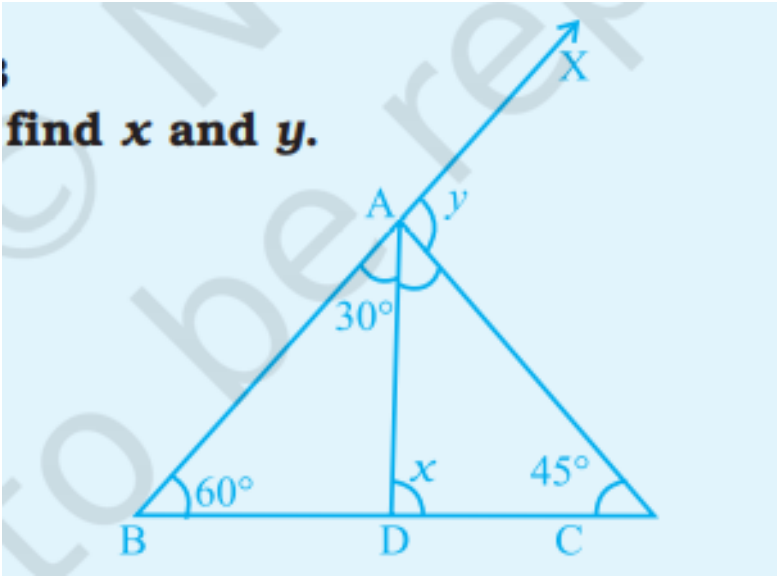
Watch Video Solution

2. In given problem, can $\angle B$ be 85° instead of 60°? If yes find the values of x and y in that case.



Watch Video Solution

3. What type of triangle is ΔADC?



Watch Video Solution

4. Tell how to write a congruence statement for two triangles.

Watch Video Solution

Exercise Choose The Correct One

1. The sides of a triangle have lengths (in cm) 10, 6.5 and a, where a is a whole number. The minimum value that a can take is

A. 6

B. 5

C. 3

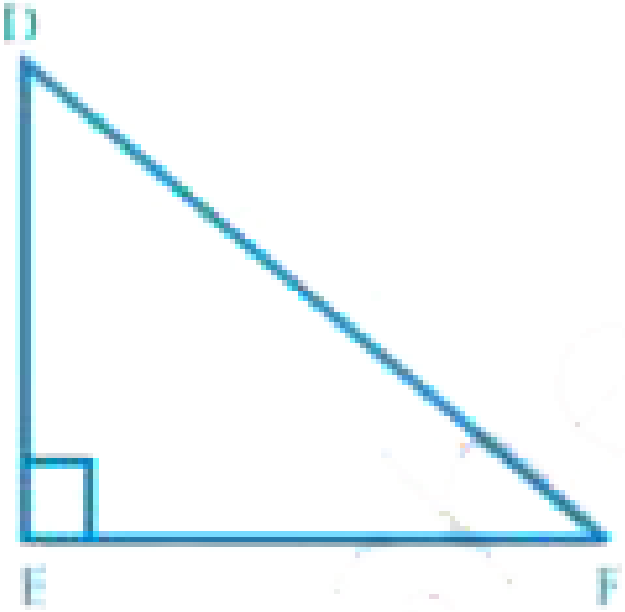
D. 4

Answer:

Watch Video Solution

2. Triangle DEF of Fig. 6.6 is a right triangle with $\angle E = 90^{\circ}$.

What type of angles are $\angle D$ and $\angle F$?



A. They are equal angles

B. They form a pair of adjacent angles

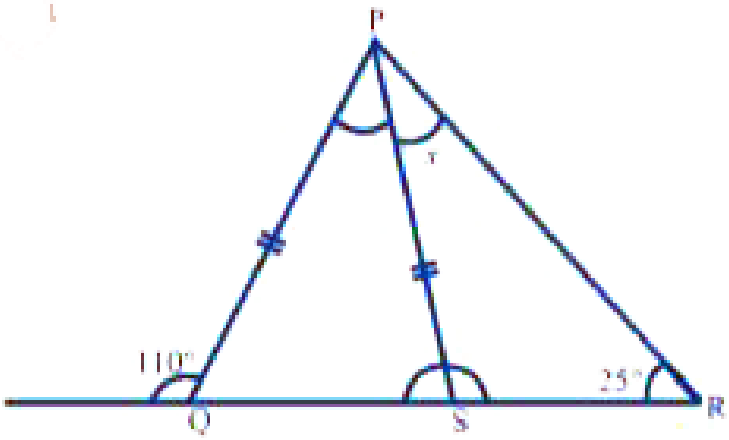
C. They are complementary angles

D. They are supplementary angles

Answer: C

Watch Video Solution

3. In Fig. 6.7, PQ = PS. The value of x is



A. 35°

B. 45°

C. 55°

D. 70°

Answer:

Watch Video Solution

4. In a right-angled triangle, the angles other than the right angle are

A. obtuse

B. right

C. acute

D. straight

Answer:

Watch Video Solution

5. In an isosceles triangle, one angle is 70°. The other two angles are of

I. 55° and 55° II. 70° and 40°. III. Any measure

In the given option(s) which of the above statement(s) are true?

A. I only

B. ii only

C. iii only

D. I and ii only

Answer:

Watch Video Solution

6. In a triangle, one angle is of 90°

Then(i) The other two angles are of 45° each

(ii) In remaining two angles, one angle is 90° and other is 45°

(iii) Remaining two angles are complementary

In the given option(s) which is true?

A. I only

B. ii only

C. iii only

D. I and ii only

Answer:

Watch Video Solution

7. Lengths of sides of a triangle are 3 cm, 4 cm and 5 cm. The triangle is

A. obtuse angled triangle

B. acute angled triangle

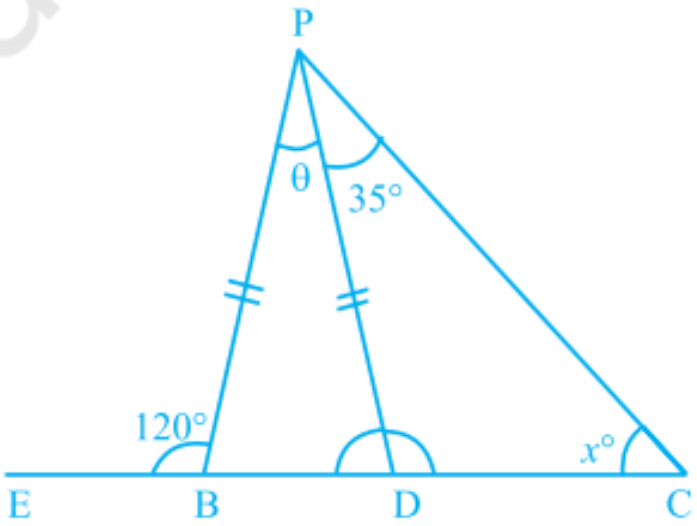
C. Right angled triangle

D. An isosceles right triangle

Answer:

Watch Video Solution

8. In Fig. 6.8, PB = PD. The value of x is



A. 85°

B. 90°

C. 25°

D. 35°

Answer: C

Watch Video Solution

9. In ΔABC.

A. $AB + BC > AC$

B. $AB + BC < AC$

C. $AB + AC < BC$

D. $AC + BC < AB$

Answer: A

Watch Video Solution

10. The top of a broken tree touches the ground at a distance of 12 m from its base. If the tree is broken at a height of 5 m from the ground then the actual height of the tree is

A. 25m

B. 13m

C. 18m

D. 17m

Answer:

Watch Video Solution

11. The trianlge ABC formed by AB = 5 cm, BC = 8 cm, AC = 4 cm is

A. an isosceles triangle only

B. a scalene triangle only

C. an isosceles right triangle

D. None

Answer: B

Watch Video Solution

12. Two trees 7 m and 4 m high stand upright on a ground. If their bases (roots) are 4 m apart, then the distance between their tops is

A. 3m

B. 5m

C. 4m

D. 11m

Answer:

Watch Video Solution

13. If in an isosceles triangle, each of the base angles is 40^{o}, then the triangle is

A. right angled triangle

B. acute angled triangle

C. Obtuse angled triangle

D. isosceles right angled triangle

Answer:

Watch Video Solution

14. If two angles of a triangle are 60° each, then the triangle is

A. isosceles but not equilateral

B. scalene

C. Equilateral

D. Right angled

Answer:

Watch Video Solution

15. The perimeter of the rectangle whose length is 60 cm and a diagonal is 61 cm is

A. 120cm

B. 122cm

C. 71cm

D. 142cm

Answer:

Watch Video Solution

16. In ΔPQR, if $PQ = QR$ and $\angle Q = 100^\circ$, then $\angle R$ is equal to

A. 40°

B. 80°

C. 120°

D. 50°

Answer:

Watch Video Solution

17. Which of the following statements is not correct?

A. The sum of any two sides of a triangle is greater than the third side

B. A triangle can have all its angles acute

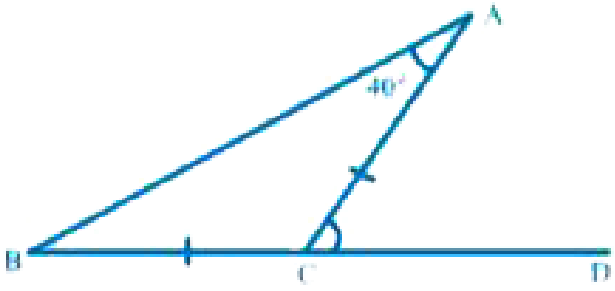
C. A right-angled triangle cannot be equilateral

D. Difference of any two sides of a triangle is greater than the third side

Answer: D

Watch Video Solution

18. In Figure, BC = CA and $\angle A = 40$. Then, $\angle ACD$ is equal to



A. 40°

B. 80°

C. 120°

D. 60°

Answer: B

Watch Video Solution

19. The length of two sides of a triangle are 7 cm and 9 cm. The length of the third side may lie between

A. 1 cm and 10 cm

B. 2 cm and 8 cm

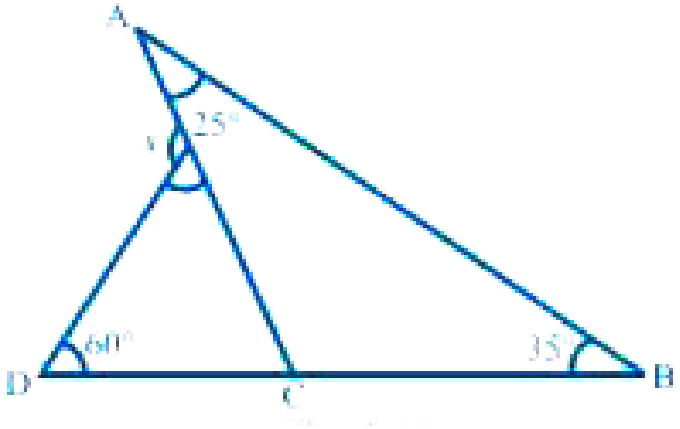
C. 3 cm and 16 cm

D. 1 cm and 16 cm

Answer: C

Watch Video Solution

20. From Fig. 6.10, the value of x is



A. 75°

B. 90°

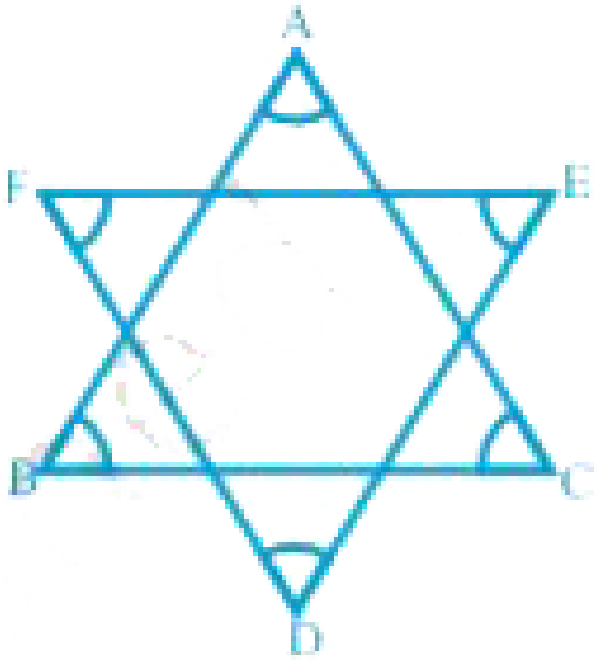
C. 120°

D. 60°

Answer:

Watch Video Solution

21. In Fig. 6.11, the value of $\angle A + \angle B + \angle C + \angle D + \angle E + \angle F$ is



A. 190°

B. 540°

C. 360°

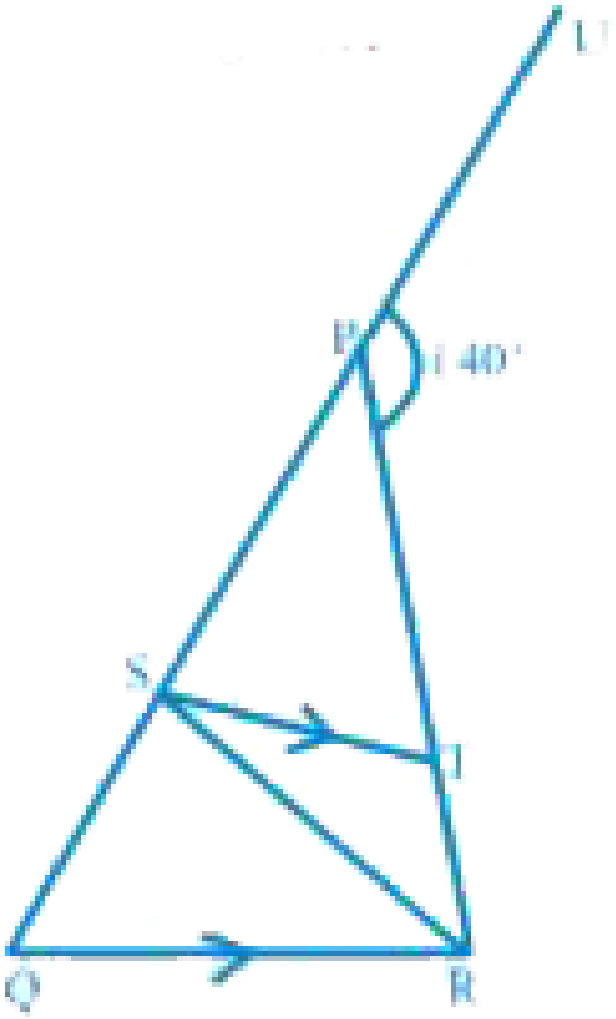
D. 180°

Answer:

Watch Video Solution

22. In Fig. 6.12, PQ = PR, RS = RQ and $ST \parallel QR$. If the exterior angle RPU is 140°,

then the measure of angle TSR is



A. 55°

B. 40°

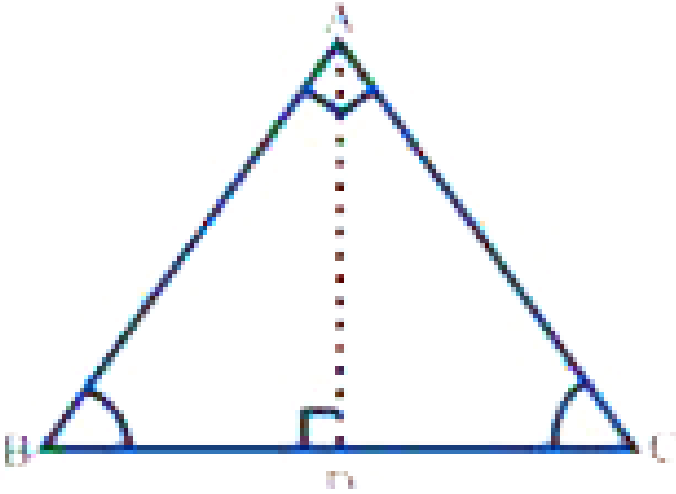
C. 50°

D. 45°

Answer:

Watch Video Solution

23. In Fig. 6.13, $\angle BAC = 90^\circ$, $AD \perp BC$ and $\angle BAD = 50^\circ$, then $\angle ACD$ is



A. 50°

B. 40°

C. 70°

D. 60°

Answer:

Watch Video Solution

24. If one angle of a triangle is equal to the sum of the other two angles, the triangle is

A. obtuse

B. acute

C. right

D. equilateral

Answer:

Watch Video Solution

25. If the exterior angle of a triangle is 130° and its interior opposite angles are equal, then measure of each interior opposite angle is

A. 55°

B. 65°

C. 50°

D. 60°

Answer: B

Watch Video Solution

26. If one of the angles of a triangle is 110°, then the angle between the bisectors of the other two angles is

A. 70°

B. 110°

C. 35°

D. 145°

Answer:

Watch Video Solution

27. In $\Delta ABC, AD$ is the bisector of $\angle A$ meeting BC at D, $CF \perp AB$ and E is the mid-point of AC. Then median of the triangle is

A. AD

B. BE

C. FC

D. DE

Answer:

Watch Video Solution

28. In ΔPQR, if $\angle P = 60^\circ$, and $\angle Q = 40^\circ$, then the exterior angle formed by producing QR is equal to

A. 60°

B. 120°

C. 100°

D. 80°

Answer: C

Watch Video Solution

29. Which of the following triplets cannot be the angles of a triangle?

A. $67^\circ, 51^\circ, 62^\circ$

B. $70^\circ, 83^\circ, 27^\circ$

C. $90^\circ, 70^\circ, 20^\circ$

D. $40^\circ, 132^\circ, 18^\circ$

Answer: D

Watch Video Solution

30. Which of the following can be the length of the third side of a triangle whose two sides measure 18 cm and 14 cm?

A. 4cm

B. 3cm

C. 5cm

D. 32cm

Answer:

Watch Video Solution

31. How many altitudes does a triangle have?

A. 1

B. 3

C. 6

D. 9

Answer: B

Watch Video Solution

32. If we join a vertex to a point on opposite side which divides that side in the ratio $1:1$, then what is the special name of that line segment?

A. Median

B. Angle bisector

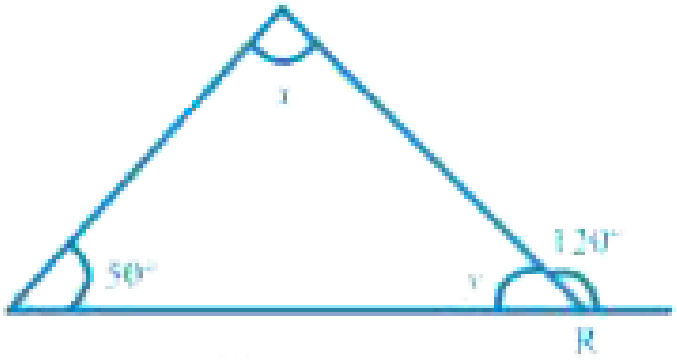
C. Altitude

D. Hypotenuse

Answer:

Watch Video Solution

33. The measures of $\angle x$ and $\angle y$ in Fig.6.14 are respectively



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

B. $40^\circ, 40^\circ$

C. $70^\circ, 70^\circ$

D. $70^\circ, 60^\circ$

Answer:

Watch Video Solution

34. If length of two sides of a triangle are 6 cm and 10 cm, then the length of the third side can be

A. 3cm

B. 4cm

C. 2cm

D. 6cm

Answer:

Watch Video Solution

35. In a right-angled triangle ABC, if angle $B = 90^\circ$, BC = 3 cm and AC = 5 cm, then the length of side AB is

A. 3cm

B. 4cm

C. 5cm

D. 6cm

Answer:

Watch Video Solution

36. In a right-angled triangle ABC, if angle $B = 90^\circ$, then which of the following is true?

A. $AB^2 = BC^2 + AB^2$

B. $AC^2 = AB^2 + BC^2$

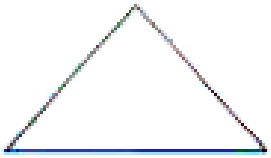
C. $AB = BC + AC$

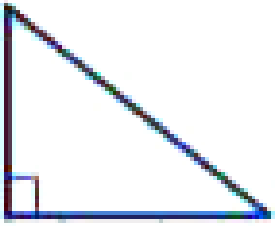
D. $AC = AB + BC$

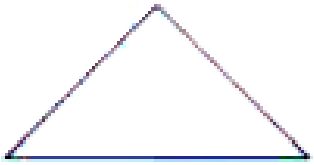
Answer:

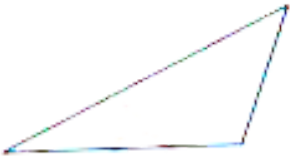
Watch Video Solution

37. Which of the following figures will have it's altitude outside the triangle

A. 

B. 

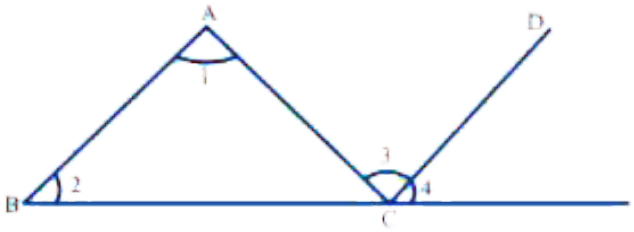
C. 

D. 

Answer: D

Watch Video Solution

38. In Fig.6.16 IF $AB \mid\mid CD$, then



A. $\angle 2 = \angle 3$

B. $\angle 1 = \angle 4$

C. $\angle 4 = \angle 1 + \angle 2$

D. $\angle 1 + \angle 2 = \angle 3 + \angle 4$

Answer:

Watch Video Solution

39. In $ABC, \angle A = 100^0$,

$AD\ bisects\ \angle A\ and\ AD \perp BC\dot{f} \in d\ \angle B.$

A. 80°

B. 20°

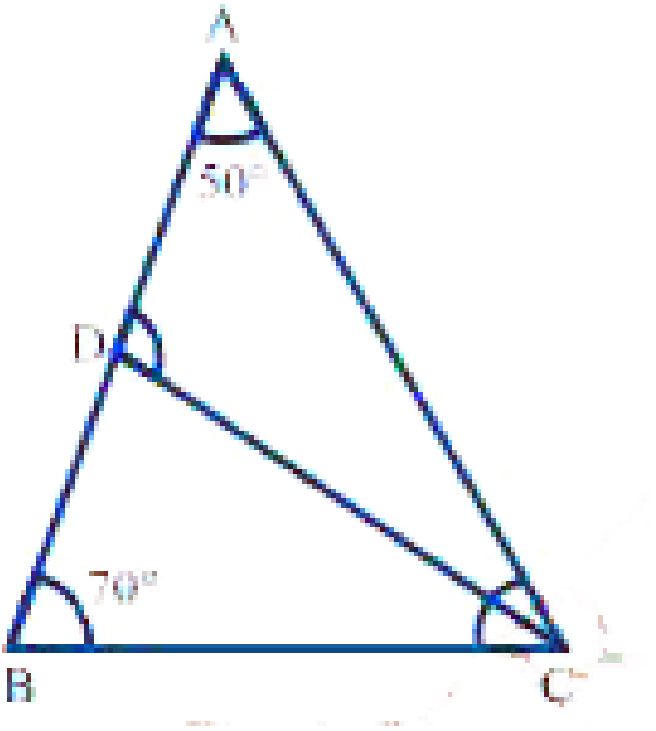
C. 40°

D. 30°

Answer:

Watch Video Solution

40. In $\Delta\, ABC$, $\angle \mathrm{A} = 50^\circ$, $\angle B = 70^\circ$ and bisector of $\angle C$ meets AB in D (Fig. 6.17). Measure of $\angle ADC$ is.



A. 50°

B. 100°

C. 30°

D. 70°

Answer:

Watch Video Solution

41. If for ΔABC and ΔDEF, the correspondence $CAB \leftrightarrow EDF$ gives a congruence, then which of the following is not true?

A. $AC = DE$

B. $AB = EF$

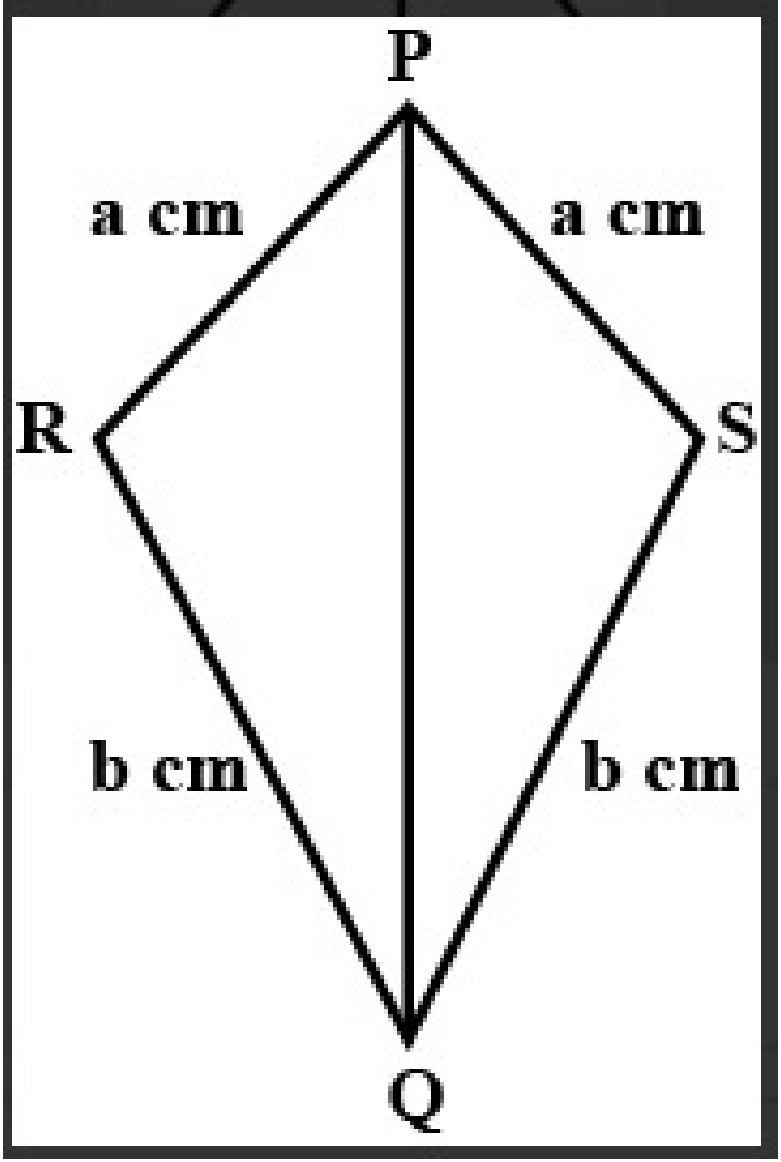
C. $\angle A = \angle D$

D. $\angle C = \angle E$

Answer: B

Watch Video Solution

42. By which congruency criterion, the two triangles in Figure are congruent?



A. RHS

B. ASA

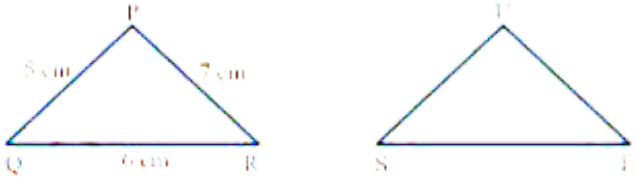
C. SSS

D. SAS

Answer: C

Watch Video Solution

43. If ΔPQR is congruent to ΔSTU (Fig. 6.20), then what is the length of TU?



A. 5cm

B. 6cm

C. 7cm

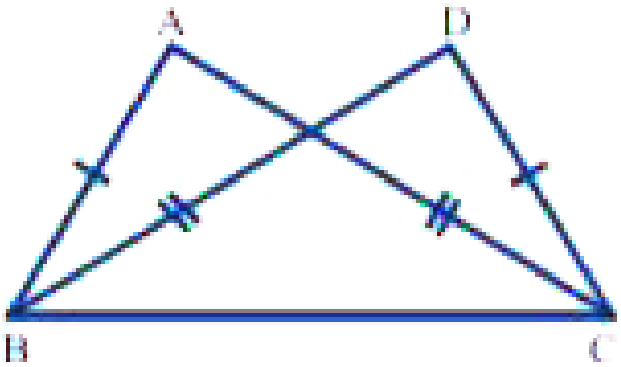
D. cannot be determined

Answer:

Watch Video Solution

44. If ΔABC and ΔDBC are on the same base BC, AB = DC and AC = DB, then which of

the following gives a congruence relationship?



A. $\Delta ABC \cong \Delta DBC$

B. $\Delta ABC \cong \Delta CBD$

C. $\Delta ABC \cong \Delta DCB$

D. $\Delta ABC \cong \Delta BCD$

Answer: C

Watch Video Solution

Exercise Fill In The Blanks

1. If ΔPQR and ΔXYZ are congruent under the correspondence $QPR \leftrightarrow XYZ$, then

$\angle R = \ldots\ldots$

Watch Video Solution

2. In Fig.6.24 $\Delta \ldots\ldots\ldots \approx \Delta PQR$

Watch Video Solution

Exercise True Or False

1. The difference between the lengths of any two sides of a triangle is smaller than the

length of third side.

Watch Video Solution

2. Sum of any two angles of a triangle is always greater than the third angle.

Watch Video Solution

3. The sum of the measures of three angles of a triangle is greater than 180°

Watch Video Solution

4. It is possible to have a right-angled equilateral triangle

Watch Video Solution

5. State True or False

If M is the mid-point of a line segment AB, then we can say that AM and MB are congruent

Watch Video Solution

6. It is possible to have a triangle in which two of the angles are right angles

7. It is possible to have a triangle in which two of the angles are obtuse.

8. It is possible to have a triangle in which two angles are acute.

Watch Video Solution

9. State Whether Statements are True or False : It is possible to have a triangle in which each angle is less than 60°.

Watch Video Solution

10. State Whether Statement is True or False :

It is possible to have a triangle in which each angle is greater than 60°.

Watch Video Solution

11. It is possible to have a triangle in which each angle is equal to 60°.

Watch Video Solution

12. A right-angled triangle may have all sides equal.

Watch Video Solution

13. A one rupee coin is congruent to a five rupee coin. (True/False)

Watch Video Solution

14. Two acute angles are congruent

Watch Video Solution

15. Two right angles are congruent

Watch Video Solution

16. Two figures are congruent, if they have the same shape.

Watch Video Solution

17. If the areas of two squares is same, they are congruent.

Watch Video Solution

18. If the areas of two rectangles are same, they are congruent

Watch Video Solution

19. If the areas of two circles are the same, they are congruent.

Watch Video Solution

20. Two squares having same perimeter are congruent.

Watch Video Solution

21. Two circles having same circumference are congruent.

Watch Video Solution

22. State True or False : If three angles of two triangles are equal, triangles are congruent.

Watch Video Solution

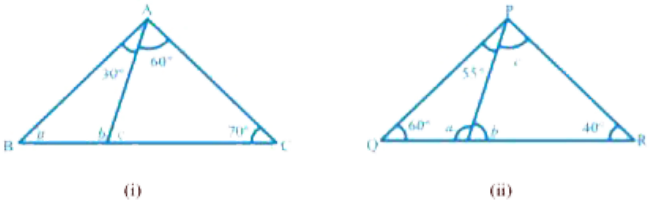
23. If hypotenuse and an acute angle of one right triangle are equal to the hypotenuse and an acute angle of another right triangle, then the triangles are congruent

Watch Video Solution

24. The measure of three angles of a triangle are in the ratio $5:3:1$. Find the measures of these angles.

Watch Video Solution

25. In Fig. 6.31(i) and (ii), find the values of a, b and c.



(i) (ii)

Watch Video Solution

26. In triangle XYZ, the measure of angle X is 30° greater than the measure of angle Y and angle Z is a right angle. Find the measure of $\angle Y$.

Watch Video Solution

27. In a triangle ABC, the measure of angle A is 40° less than the measure of angle B and 50° less than that of angle C. Find the measure of $\angle A$.

Watch Video Solution

28. I have three sides. One of my angle measures 15°. Another has a measure of60°.

What kind of a polygon am I? If I am a triangle, then what kind of triangle am I?

Watch Video Solution

29. Jiya walks 6 km due east and then 8 km due north. How far is she from her starting place?

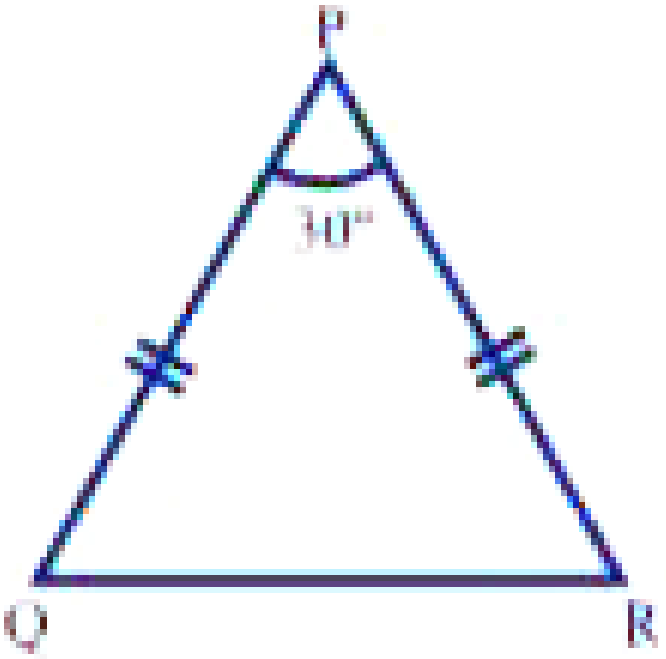
Watch Video Solution

30. Jayanti takes shortest route to her home by walking diagonally across a rectangular

park. The park measures 60 metres $\times$ 80 metres. How much shorter is the route across the park than the route around its edges?

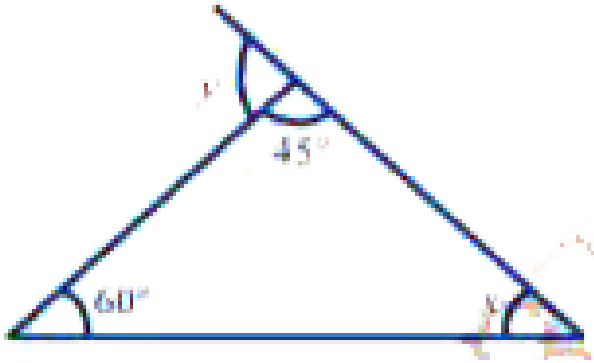
Watch Video Solution

31. In ΔPQR of Fig. 6.32, PQ = PR. Find the measures of $\angle Q$ and $\angle R$.



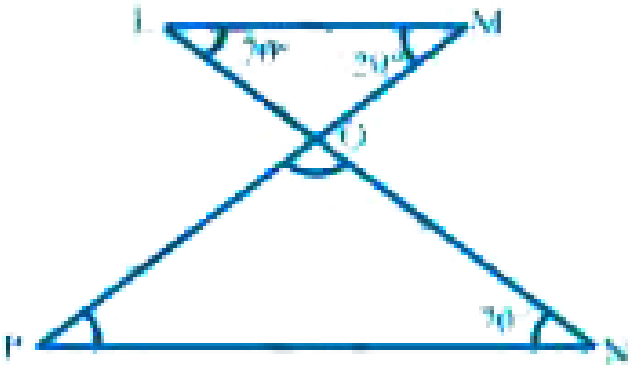
Watch Video Solution

32. In Fig. 6.33, find the measures of $\angle x$ and $\angle y$.



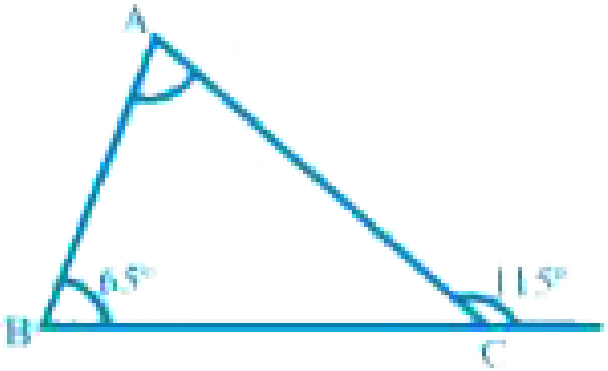
Watch Video Solution

33. In Fig. 6.34, find the measures of $\angle PON$ and $\angle NPO$



Watch Video Solution

34. Find the measure of $\angle A$ in Fig. 6.36



Watch Video Solution

35. In a right-angled triangle if an angle measures 35°, then find the measure of the third angle.

Watch Video Solution

36. Each of the two equal angles of an isosceles triangle is four times the third angle. Find the angles of the triangle

Watch Video Solution

37. The angles of a triangle are in the ratio $2:3:5$. Find the angles

Watch Video Solution

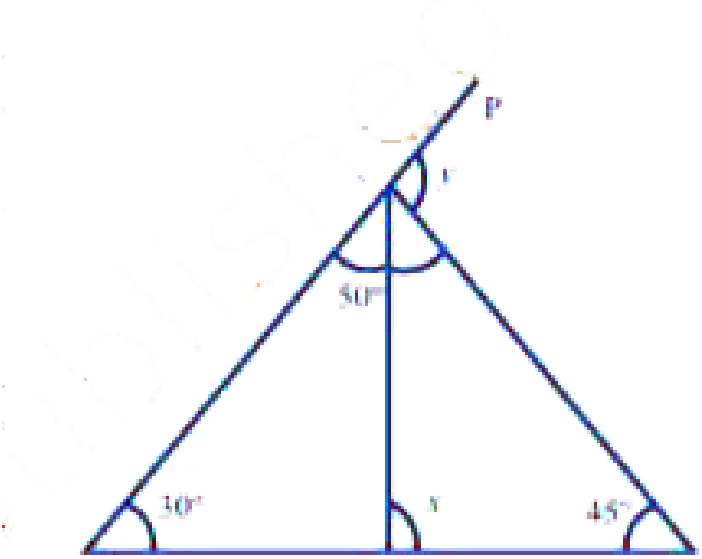
38. If the sides of a triangle are produced in an order, show that the sum of the exterior angles so formed is 360°.

Watch Video Solution

39. In ΔABC, if $\angle A = \angle C$, and exterior angle $ABX = 140^{\circ}$, then find the angles of the triangle

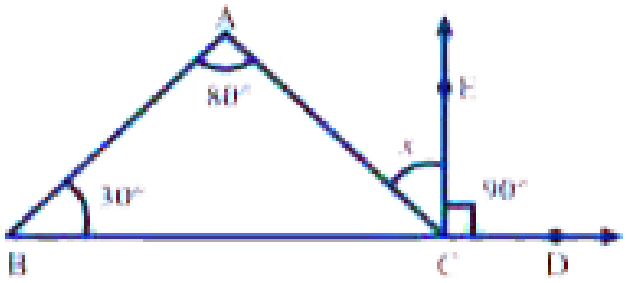
Watch Video Solution

40. Find the values of x and y in Fig. 6.37



Watch Video Solution

41. Find the value of x in Fig. 6.38

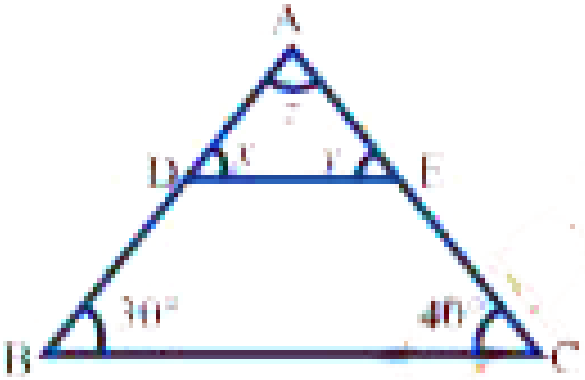


Watch Video Solution

42. The angles of a triangle are arranged in descending order of their magnitudes. If the difference between two consecutive angles is 10°, find the three angles.

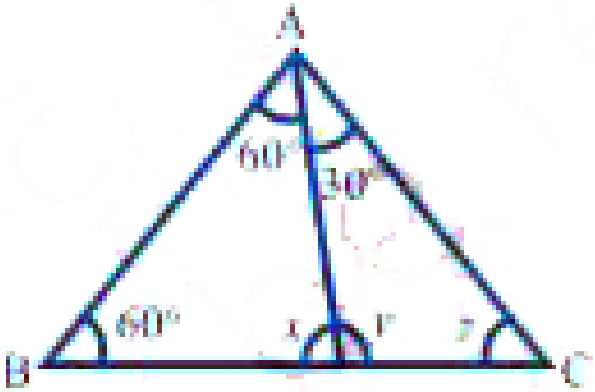
Watch Video Solution

43. In $\Delta ABC, DE \| BC$ (Fig. 6.39). Find the values of x, y and z.



Watch Video Solution

44. In Fig. 6.40, find the values of x, y and z.



Watch Video Solution

45. If one angle of a triangle is 60° and the other two angles are in the ratio $1:2$, find the angles.

Watch Video Solution

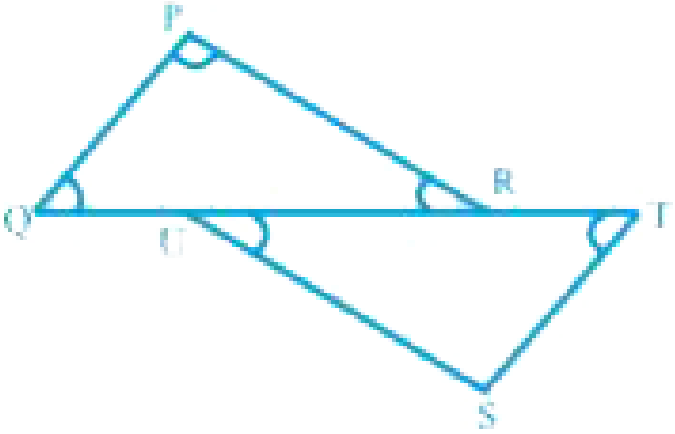
46. In ΔPQR, if $3\angle P = 4\angle Q = 6\angle R$, calculate the angles of the triangle.

Watch Video Solution

47. In ΔDEF, $\angle D = 60^\circ$, $\angle E = 70^\circ$ and the bisectors of $\angle E$ and $\angle F$ meet at O. Find (i) $\angle F$ (ii) $\angle EOF$.

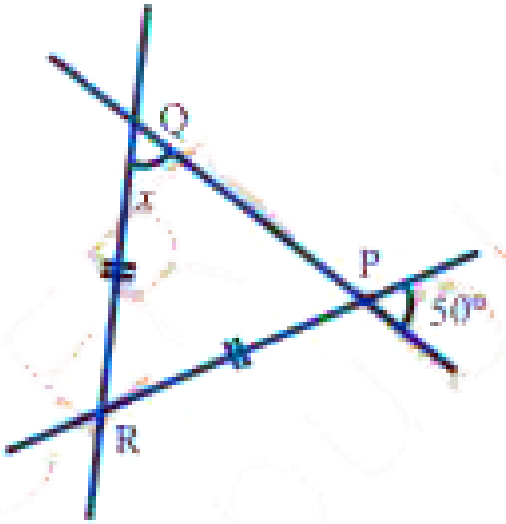
Watch Video Solution

48. In Fig. 6.41, ΔPQR is right-angled at P. U and T are the points on line QRF. If $QP \mid\mid ST$ and $US \mid\mid RP$, find $\angle S$



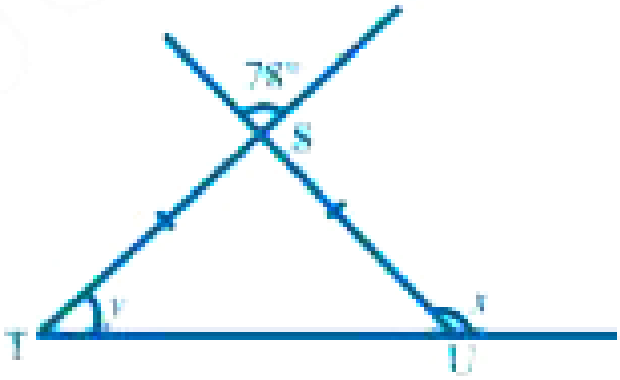
Watch Video Solution

49. In Fig. 6.44, if RP = RQ, find the value of x.



Watch Video Solution

50. In Fig. 6.45, if ST = SU, then find the values of x and y.



Watch Video Solution

51. Check whether the following measures (in cm) can be the sides of a right-angled triangle or not.

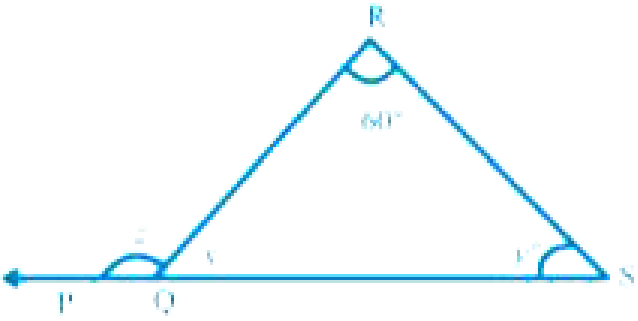
1.5, 3.6, 3.9

Watch Video Solution

52. Height of a pole is 8 m. Find the length of rope tied with its top from a point on the ground at a distance of 6 m from its bottom.

Watch Video Solution

53. In Fig. 6.46, if y is five times x, find the value of z.



Watch Video Solution

54. The lengths of two sides of an isosceles triangle are 9 cm and 20 cm. What is the perimeter of the triangle? Give reason.

Watch Video Solution

55. Without drawing the triangles write all six pairs of equal measures in each of the following pairs of congruent triangles.

(i) $\Delta STU \approx \Delta DEF$

(ii) $\Delta ABC \approx \Delta LMN$

(iii) $\Delta YZX \approx PQR$

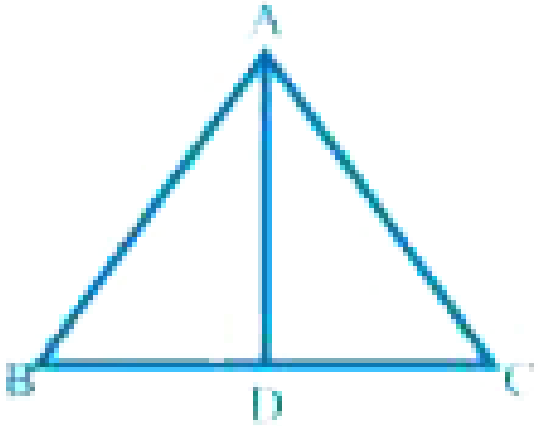
(iv) $\Delta XYZ \approx \Delta MLN$

Watch Video Solution

56. ABC is an isosceles triangle with AB = AC and D is the mid-point of base BC.

(a) State three pairs of equal parts in the

triangles ABD and ACD.

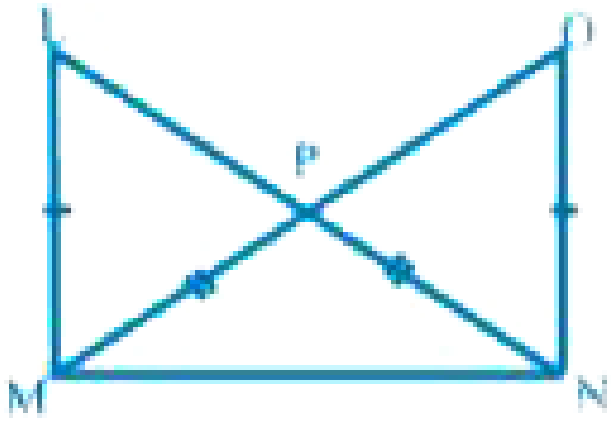


Watch Video Solution

57. In Figure, it is given that LM = ON and NL = MO

(a) State the three pairs of equal parts in the triangles NOM and MLN.

(b) Is $\Delta NOM \cong \Delta MLN$. Give reason



Watch Video Solution

58. Triangles DEF and LMN are both isosceles with DE = DF and LM = LN, respectively. If DE = LM and EF = MN, then, are the two triangles

congruent? Which condition do you use? If $\angle E = 40^\circ$, what is the measure of $\angle N$?

Watch Video Solution

59. If ΔPQR and ΔSQR are both isosceles triangle on a common base QR such that P and S lie on the same side of QR. Are triangles PSQ and PSR congruent? Which condition do you use?

Watch Video Solution

60. State which of the following pairs of triangles are congruent. If yes, write them in symbolic form (you may draw a rough figure).

$\Delta PQR: PQ = 3.5cm, QR = 4.0cm, \angle Q = 60^\circ$

$\Delta STU: ST = 3.5cm, TU = 4cm, \angle T = 60^\circ$

Watch Video Solution

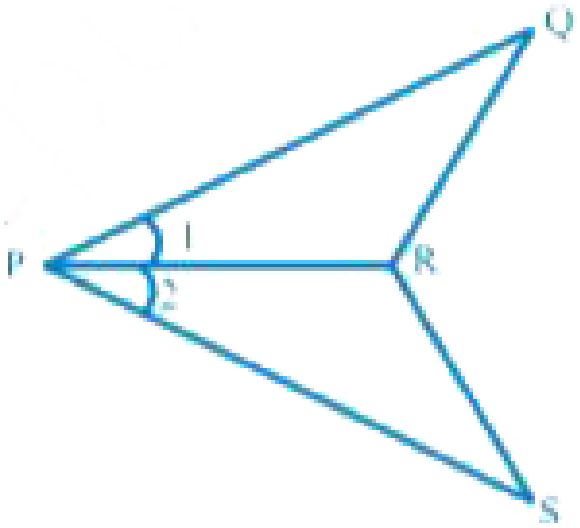
61. State which of the following pairs of triangles are congruent. If yes, write them in symbolic form (you may draw a rough figure).

$\Delta\, ABC: AB = 4.8cm, \angle A = 90^\circ, AC = 6.8cm$

$\Delta\, XYZ: YZ = 6.8cm, \angle X = 90^\circ, ZX = 4.8cm$

Watch Video Solution

62. In Figure, PQ = PS and $\angle 1 = \angle 2$.

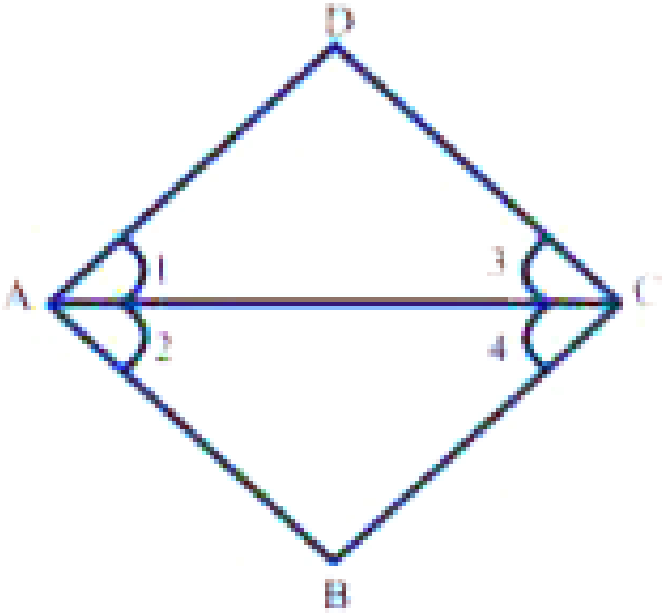


(i) Is $\Delta PQR \cong \Delta PSR$? Give reasons.

(ii) Is QR = SR? Give reasons.

Watch Video Solution

63. In Figure, $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$

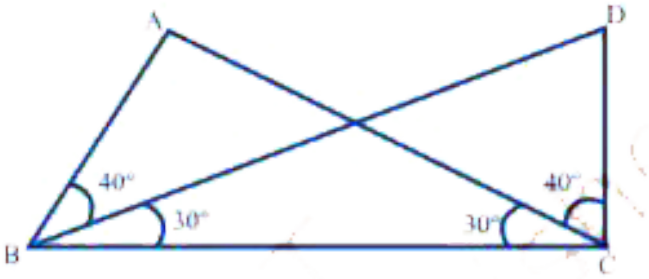


. (i) Is $\Delta\, ADC \cong \Delta\, ABC$? Why ?

(ii) Show that AD = AB and CD = CB.

Watch Video Solution

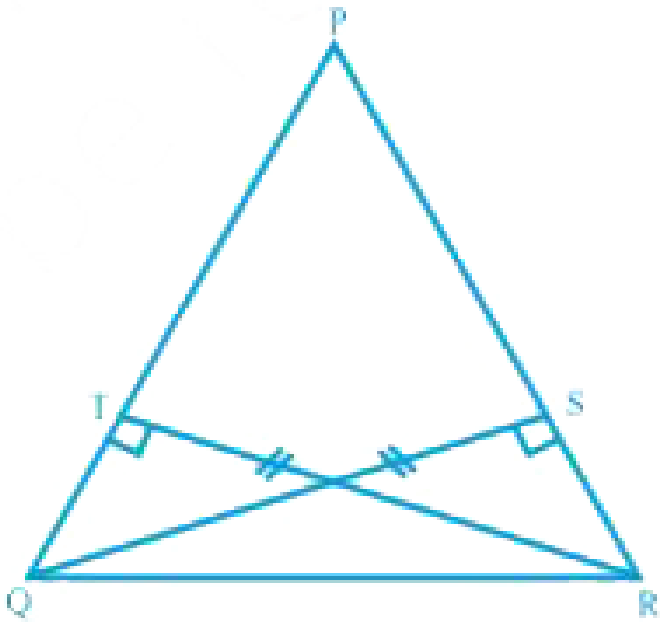
64. Observe Figure and state the three pairs of equal parts in triangles ABC and DBC.



(i) Is $\Delta\, ABC \cong \Delta\, DCB$? Why? (ii) Is AB = DC? Why? (iii) Is AC = DB? Why

Watch Video Solution

65. In Fig. 6.55,$QS \perp PR$, $RT \perp PQ$ and QS = RT.

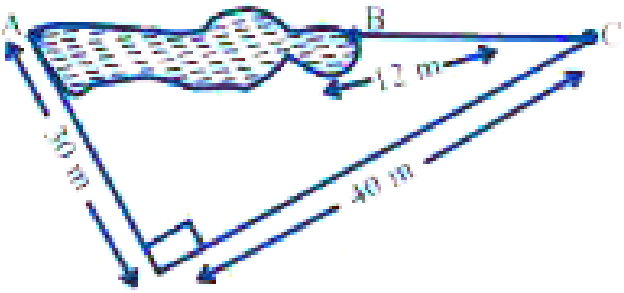


(i) Is $\Delta QSR \cong \Delta RTQ$? Give reasons. (ii) Is $\angle PQR = \angle PRQ$? Give reasons.

Watch Video Solution

Watch Video Solution

66. Points A and B are on the opposite edges of a pond as shown in Fig. 6.56. To find the distance between the two points, the surveyor makes a right-angled triangle as shown. Find the distance AB.



Watch Video Solution

67. Two poles of 10 m and 15 m stand upright on a plane ground. If the distance between the tops is 13 m, find the distance between their feet.

Watch Video Solution

68. The foot of a ladder is 6 m away from its wall and its top reaches a window 8 m above the ground, Find the length of the ladder.

Watch Video Solution

69. In Figure, state the three pairs of equal parts in ΔABC and ΔEOD. Is $\Delta ABC \cong \Delta EOD$? Why?

Watch Video Solution