EXERCISE PAGE: 159

In each of the questions 1 to 49, four options are given, out of which only one is correct. 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

Solution:-

(d) 4

In the question two sides are given, 10 and 6.5.

We know that, the sum of the lengths of any two sides of a triangle is always greater than the length of the third side.

So, 6.5 + a = 10

a > 10 – 6.5

a > 3.5 i.e. 4

2. Triangle DEF of Fig. 6.6 is a right triangle with ∠E = 90°. What type of angles are ∠D and ∠F?

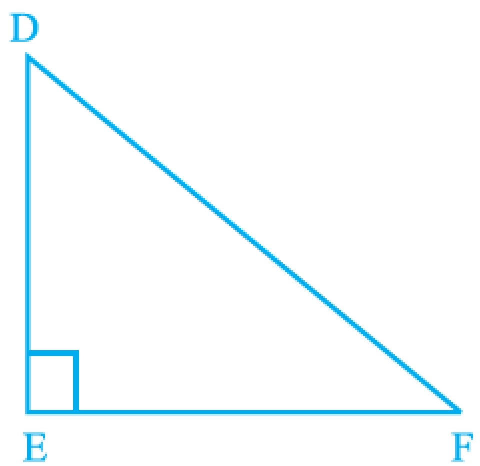


Fig. 6.6

(a) They are equal angles

(b) They form a pair of adjacent angles

(c) They are complementary angles

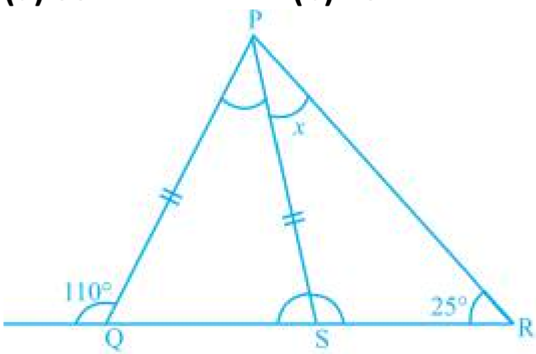
(d) They are supplementary angles

Solution: -

(c) They are complementary angles

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

(a) 35^o (b) 45^o (c) 55^o (d) 70^o



Solution:-

(b) 45^o

From the given figure,

In triangle PQS, $\angle PSQ + \angle QPS = 110^o$ … [from exterior angle property of a triangle]

We know that, sum of all angle of the triangle is equal to 180^o.

So, $\angle PSQ + \angle QPS + \angle PQS = 180^o$

$110^o + \angle PQS = 180^o - 110^o$

$\angle PQS = 70^o$

Now, consider the triangle PRS,

$\angle PSQ = x + 25^o$ … [from the exterior angle property of a triangle]

$X = 70^o - 25^o$

$X = 45^o$

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

(a) obtuse (b) right (c) acute (d) straight

Solution:-

(c) acute

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)

Solution:-

(d) (i) and(ii)

From the question it is given that,

One angle of isosceles triangle is 70^o.

We know that, in an isosceles triangle 2 angles are equal corresponding with 2 equal sides,

If 70^o is 3rd angle of triangle,

$70^o + x + x = 180^o$

$2x + 70^o = 180^o$

$2x = 180^o - 70^o$

$x = (110^o/2)$

$x = 55^o$

So, both angles are 55^o

Consider the 70^o as base angle of isosceles triangle

Then, $70^o + 70^o + x = 180^o$

$x = 180^o - 140^o$

$x = 40^o$

So, one angle is 40^o and another is 70^o

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)

Solution:-

(c) (iii) only

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

Solution:-

(c) Right-angled triangle

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

(a) 85^o (b) 90^o (c) 25^o (d) 35^o

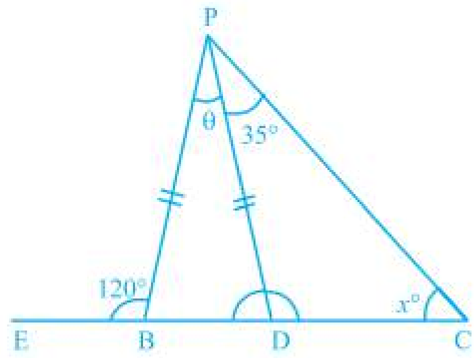


Fig. 6.8

Solution:-

(c) 25°

Exterior angle of triangle is equal to sum of 2 opposite interior angles.

As BC is straight line

∠PBD + 120° = 180°

∠PBD = 180° - 120°

∠PBD = 60°

As ΔPBD is isosceles triangle and PB = PD

∴ ∠PBD = ∠PDB

⇒ ∠PDB = 60°

In ΔPSR

With exterior angle ∠PSQ equal to sum of opposite interior angles

∠PDB = ∠DPC + ∠PCD

60° = x + 35°

x = 60° - 35°

x = 25°

9. In ΔPQR,

(a) PQ – QR > PR

(b) PQ + QR < PR

(c) PQ – QR< PR

(d) PQ + PR< QR

Solution:-

(c) PQ – QR < PR

The difference of the lengths of any two sides of a triangle is always smaller than the length of the third side.

10. In Δ ABC,

(a) AB + BC > AC
(b) AB + BC < AC
(c) AB + AC < BC
(d) AC + BC < AB
Solution:-
(a) AB + BC > AC
The sum of the lengths of any two sides of a triangle is always greater than the length of the third side.

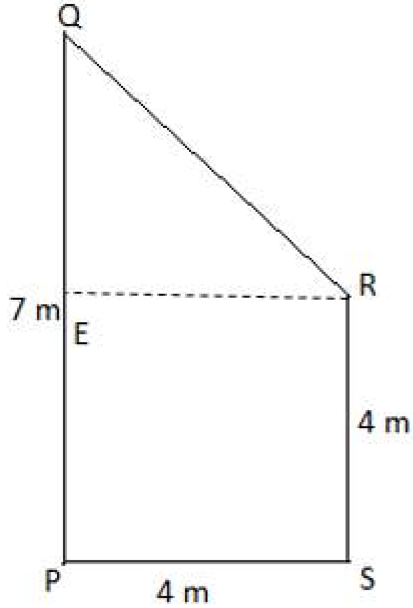
11. The top of a broken tree touches the ground at a distance of 12 m from its base. If the tree is broken at a height of 5 m from the ground then the actual height of the tree is
(a) 25 m (b) 13 m (c) 18 m (d) 17 m
Solution: -
(c) 18 m
From the question it is given that,
The top of a broken tree touches the ground at a distance of 12 m from its base
The broken height of the tree = 5 m
By using Pythagoras theorem,
$\text{Hypotenuse}^2 = \text{Base}^2 + \text{Height}^2$
$\text{Hypotenuse}^2 = 12^2 + 5^2$
$\text{Hypotenuse}^2 = 144 + 25$
$\text{Hypotenuse}^2 = 169$
Hypotenuse = $\sqrt{169}$
Hypotenuse = 13
So, the total height of tree = 5 + 13 = 18 m

12. The triangle 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) scalene as well as a right triangle
Solution: -
(b) a scalene triangle only
A scalene triangle is a triangle that has three unequal sides.

13. 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) 3 m (b) 5 m (c) 4 m (d) 11 m

Solution:-

(b) 5 m



Consider PQ is the tree of height 7m and RS is the tree of height 4 m.

So, consider the triangle QRE, from the Pythagoras theorem,

$QR^2 = QE^2 + ER^2$

$QR^2 = 3^2 + 4^2$

$QR^2 = 9 + 16$

$QR^2 = 25$

$QR = \sqrt{25}$

$QR = 5$

Therefore, the distance between the top of the two trees is 5m.

14. If in an isosceles triangle, each of the base angles is 40°, then the triangle is

(a) Right-angled triangle **(b) Acute angled triangle**

(c) Obtuse angled triangle **(d) Isosceles right-angled triangle**

Solution: -

(c) Obtuse angled triangle

We know that, sum of interior angles of triangle is equal to 180^o.

Let us assume the 3rd angle be Q,

Then, $40^o + 40^o + Q = 180^o$

$80^o + Q = 180^o$

$Q = 180 – 80$

$Q = 100^o$

An obtuse triangle (or obtuse-angled triangle) is a triangle with one obtuse angle (greater than 90°) and two acute angles. Since a triangle's angles must sum to 180°.

15. 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**

Solution:-

(c) Equilateral

In an equilateral triangle, each angle has measure 60°.

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

(a) 120 cm **(b) 122 cm** **(c) 71 cm** **(d) 142 cm**

Solution:-

(d) 142 cm

(c) Equilateral

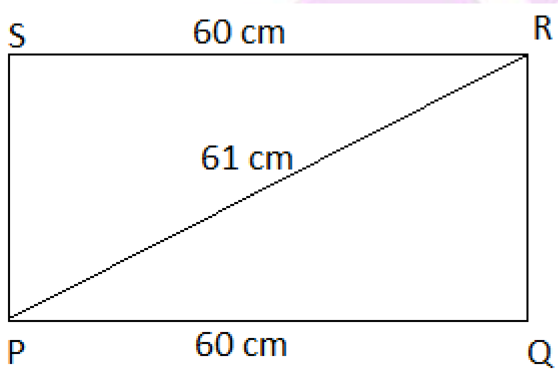
In an equilateral triangle, each angle has measure 60°.

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

(a) 120 cm **(b) 122 cm** **(c) 71 cm** **(d) 142 cm**

Solution:-

(d) 142 cm



Consider the rectangle PQRS,

Given, length of rectangle PQ = 60, Diagonal of the rectangle = 61 m.

To find out the height of the rectangle, consider the right angled triangle PQR.

From the Pythagoras theorem, $PR^2 = PQ^2 + RQ^2$

$$61^2 = 60^2 + RQ^2$$

$$3721 = 3600 + RQ^2$$

$$RQ^2 = 3721 - 3600$$

$$RQ^2 = 121$$

RQ = √121

RQ = 11 cm

Then, the perimeter of the rectangle PQRS = 2 (Length + Height)

= 2 (60 + 11)

= 2 (71)

= 142 cm

17. In ΔPQR, if PQ = QR and ∠Q = 100°, then ∠R is equal to

(a) 40° **(b) 80°** **(c) 120°** **(d) 50°**

Solution: -

(a) 40°

Given, In ΔPQR, PQ = QR so it is a isosceles triangle.

Then, ∠P = ∠R

So, let us assume two angles be x

$x + x + 100^\circ = 180^\circ$

$2x = 180^\circ – 100^\circ$

$2x = 80^\circ$

$X = 80^\circ/2$

$X = 40^\circ$

Therefore, x = ∠P = ∠R = 40°

18. 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

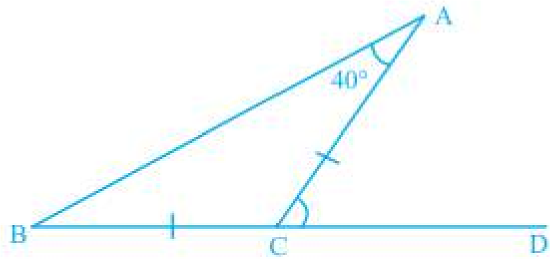
Solution: -

(d) Difference of any two sides of a triangle is greater than the third side.

The difference of the lengths of any two sides of a triangle is always smaller than the length of the third side.

19. In Fig. 6.9, BC = CA and ∠A = 40. Then, ∠ACD is equal to

(a) 40° **(b) 80°** **(c) 120°** **(d) 60°**



Solution:-

(b) 80^o

We know that, the exterior angle is equal to sum of opposite interior angles.

So, ∠ACD = ∠A + ∠B

As ΔACB is isosceles triangle with AC = BC

Therefore, ∠A must be equal to ∠B

∠ACD = $40^o + 40^o$

= 80^o

20. 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

Solution: -

(c) 3 cm and 16 cm

From the question it is given that, the length of two sides of a triangle are 7 cm and 9 cm.

Let us assume the length of the third side of the triangle be 'P'.

We Know that, the sum of the two sides of the triangle is greater than the third side.

So, $7 + 9 > P$

$16 > P$

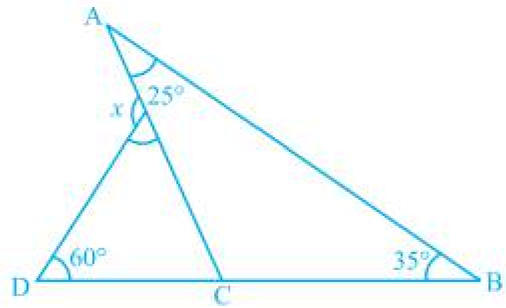
Now, difference between two sides = $9 – 7 = 2$

Therefore, the third side is greater than 2 and smaller than 16.

i.e. 3 cm and 16 cm

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

(a) 75^o **(b) 90^o** **(c) 120^o** **(d) 60^o**



Solution:-

(c) 120°

We know that, exterior angle is equal to sum of opposite interior angle.

From the figure,

∠ACD = ∠A + ∠B

∠ACD = 25° + 35°

= 60°

Then, in another triangle

x is exterior angle

∴ x = 60° + ∠ACD

x = 60° + 60°

x = 120°

22. In Fig. 6.11, the value of ∠A + ∠B + ∠C + ∠D + ∠E + ∠F is

(a) 190° **(b) 540°** **(c) 360°** **(d) 180°**

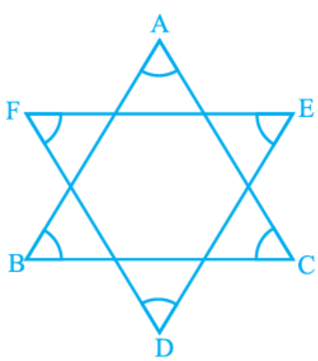


Fig. 6.11

Solution: -

(c) 360°

From the figure, we can able to find out there are two triangles.

So, consider the ΔABC,

We know that, sum of the interior angles of the triangle is equal to 180°.

Therefore, ∠A + ∠B + ∠C = 180°

Now, consider the ΔDEF,

∠D + ∠E + ∠F = 180°

Then,

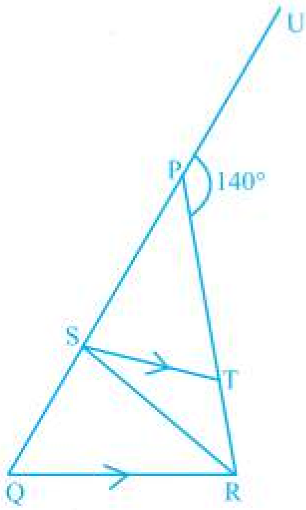
= ∠A + ∠B + ∠C + ∠D + ∠E + ∠F

= 180° + 180°

= 360°

23. In Fig. 6.12, PQ = PR, RS = RQ and ST || QR. If the exterior angle RPU is 140°, then the measure of angle TSR is

(a) 55° **(b) 40°** **(c) 50°** **(d) 45°**



Solution:-

(b) 40°

Consider the ΔPQR.

From the exterior angle property = ∠RPU - ∠PRQ + ∠PQR

∠RPU = ∠PRQ + ∠PQR

140° = 2 ∠PQR … [given PQ = PR]

∠PQR = 140/2

∠PQR = 70°

Given, ST || QR and QS is transversal.

From the property of corresponding angles, ∠PST = ∠PQR = 70°

Now, consider the ΔQSR

RS = RQ … [from the question]

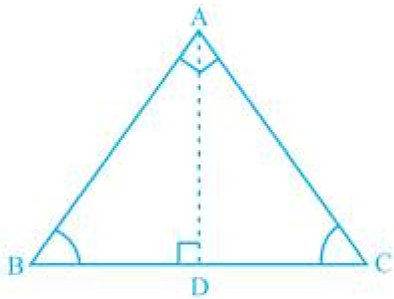
So, ∠SQR - ∠RSQ = 70°

Then, PQ is a straight line.

∠PST + ∠TSR + ∠RSQ = 180°

$70^o + \angle TSR + 70^o = 180^o$
$140^o + \angle TSR = 180^o$
$\angle TSR = 180^o - 140^o$
$\angle TSR = 40^o$

24. In Fig. 6.13, ∠BAC = 90°, AD ⊥ BC and ∠BAD = 50°, then ∠ACD is
(a) 50° **(b) 40°** **(c) 70°** **(d) 60°**



Solution:-
(a) 50^o
From the question it is given that, $\angle BAC = 90^o$ AD ⊥ BC and $\angle BAD = 50^o$
So, $\angle DAC = \angle BAC - \angle BAD$
$= 90^o - 50^o$
$= 40^o$
The, consider the ΔADC
From the rule of exterior angle property = $\angle ADB = \angle DAC + \angle ACD$
$90^o = 40^o + \angle ACD$
$\angle ACD = 90 - 40$
$\angle ACD = 50^o$

25. 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**
Solution:-
(c) right

26. 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°**
Solution:-
(b) 65^o
Let us assume the interior opposite angles are Q and Q.

Then, $130^o = Q + Q$ … [from exterior angle property]

$2Q = 130^o$

$Q = 130^o/2$

$Q = 65^o$

Therefore, the measure of each interior opposite angle is 65^o.

27. 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°**

Solution: -

(d) 145^o

From the question it is given that, one of the angles of triangle is 110^o

We know that, sum of all angles of triangle is equal to 180^o.

So, sum of other 2 angles is $180^o - 110^o = 70^o$

Then, both angled get halved $70^o/2 = 35^o$

Sum of bisected angles will be half of sum of angle of triangle.

Then, the third angle will be $= 180^o - 35^o$

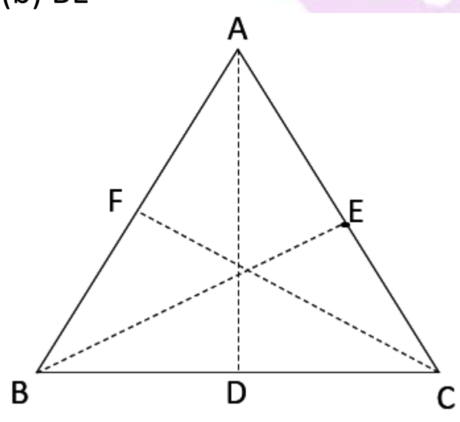
$= 145^o$

28. In ΔABC, AD is the bisector of ∠A meeting BC at D, CF ⊥ AB and E is the mid-point of AC. Then median of the triangle is

(a) AD **(b) BE** **(c) FC** **(d) DE**

Solution: -

(b) BE



29. In ΔPQR, if ∠ P = 60°, and ∠ Q = 40°, then the exterior angle formed by producing QR is equal to

(a) 60° **(b) 120°** **(c) 100°** **(d) 80°**

Solution:-

(c) 100°

As we know that, exterior angle is sum of opposite interior angles.

Then, the exterior angle formed by producing QR

It has opposite angles ∠P and ∠Q

Therefore, exterior angle = ∠P + ∠Q

= 60° + 40°

= 100°

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

(a) 67°, 51°, 62° **(b) 70°, 83°, 27°**

(c) 90°, 70°, 20° **(d) 40°, 132°, 18°**

Solution: -

(d) 40°, 132°, 18°

We now that, sum of angles of triangle is equal to 180°.

But, 40° + 132° + 18° = 190

So, these triplets cannot be the angles of a triangle.

31. 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) 4 cm **(b) 3 cm** **(c) 5 cm** **(d) 32 cm**

Solution:-

(c) 5 cm

We know that,

The sum of the lengths of any two sides of a triangle is always greater than the length of the third side.

So, 18 cm + 14 cm > 3^{rd} side

3^{rd} side < 32 cm

The difference of the lengths of any two sides of a triangle is always smaller than the length of the third side.

So, 18 – 14 < 3^{rd} side

3^{rd} side > 4 cm

Therefore, 5 cm is the length of the 3^{rd} side.

32. How many altitudes does a triangle have?

(a) 1 **(b) 3** **(c) 6** **(d) 9**

Solution: -

(b) 3

The perpendicular line segment from a vertex of a triangle to its opposite side is called an altitude of the triangle. A triangle has 3 altitudes.

33. 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

Solution:-

(a) Median

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

34. The measures of ∠x and ∠y in Fig. 6.14 are respectively

(a) 30°, 60° (b) 40°, 40°

(c) 70°, 70° (d) 70°, 60°

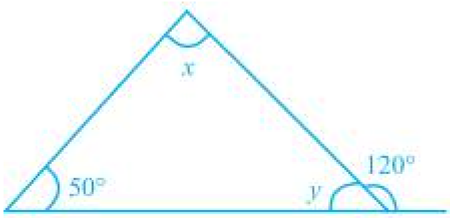


Fig. 6.14

Solution:-

(d) 70^o, 60^o

We know that, the exterior angle is sum of interior opposite angles of triangle.

So, $x + 50^o = 120^o$

$X = 120^o – 50^o$

$X = 70^o$

We also know that, sum of angles of triangle are equal to 180^o.

So, $50^o + x + y = 180^o$

$50^o + 70^o + y = 180^o$

$120^o + y = 180^o$

$Y = 180^o – 120^o$

$Y = 60^o$

Therefore, the measures of ∠x and ∠y is 70^o and 60^o respectively.

35. If length of two sides of a triangle are 6 cm and 10 cm, then the length of the third

side can be

(a) 3 cm **(b) 4 cm** **(c) 2 cm** **(d) 6 cm**

Solution: -

(d) 6 cm

We know that,

The sum of the lengths of any two sides of a triangle is always greater than the length of the third side.

So, 6 cm + 10 cm > 3rd side

3rd side < 16 cm

The difference of the lengths of any two sides of a triangle is always smaller than the length of the third side.

So, 10 – 6 < 3rd side

3rd side > 4 cm

Therefore, 6 cm is the length of the 3rd side.

36. In a right-angled triangle ABC, if angle B = 90°, BC = 3 cm and AC = 5 cm, then the length of side AB is

(a) 3 cm **(b) 4 cm** **(c) 5 cm** **(d) 6 cm**

Solution: -

(b) 4 cm

From Pythagoras theorem.

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

$5^2 = AB^2 + 3^2$

$AB^2 = 25 – 9$

$AB^2 = 16$

$AB = \sqrt{16}$

AB = 4 cm

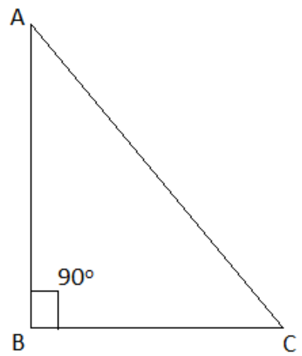
37. In a right-angled triangle ABC, if angle B = 90°, then which of the following is true?

(a) $AB^2 = BC^2 + AC^2$ **(b) $AC^2 = AB^2 + BC^2$**

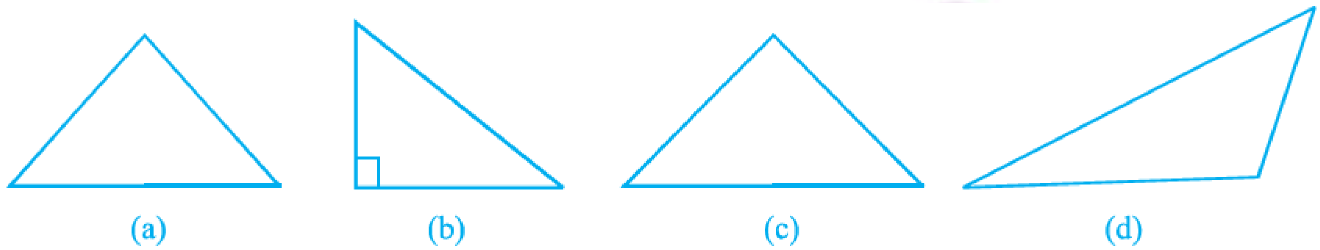
(c) AB = BC + AC **(d) AC = AB + BC**

Solution:-

(b) $AC^2 = AB^2 + BC^2$ ... [from Pythagoras theorem]



38. Which of the following figures will have its altitude outside the triangle?



Solution:-

Figure (d) have its altitude outside the triangle

39. In Fig. 6.16, if AB || CD, then,

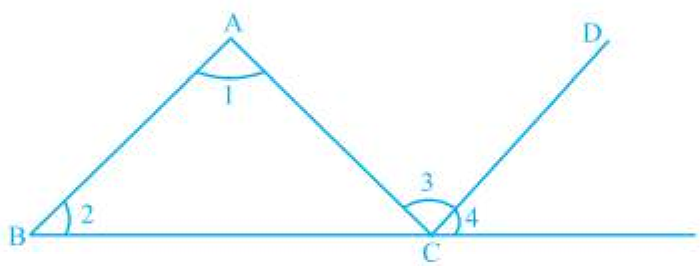


Fig. 6.16

(a) ∠ 2 = ∠ 3 **(b) ∠ 1 = ∠ 4**

(c) ∠ 4 = ∠ 1 + ∠ 2 **(d) ∠ 1 + ∠ 2 = ∠ 3 + ∠ 4**

Solution:-

(d) ∠ 1 + ∠ 2 = ∠ 3 + ∠ 4

As we know that, exterior angle is equal to the sum of opposite interior angles

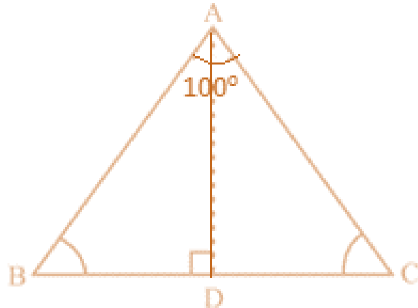
Consider, Δ ABC

As BC is extended

∠A + ∠B = ∠3 + ∠4

Therefore, ∠1 + ∠2 = ∠3 + ∠4

40. In ΔABC, ∠A = 100°, AD bisects ∠A and AD⊥BC. Then, ∠B is equal to
(a) 80° **(b) 20°** **(c) 40°** **(d) 30°**
Solution: -
(c) 40°
Consider the triangle ABC,



From the figure, AD bisects ∠A
Then, ∠BAD = 50°
∠DAC = 50°
So, AD⊥BC
∠ADC = 90°
Consider the ΔABD,
From the rule of exterior angle property of triangle,
∠ADC = ∠ABD + ∠BAD
90° = ∠ABD + 50°
∠ABD = 90° – 50°
= 40°

41. In ΔABC, ∠A = 50°, ∠B = 70° and bisector of ∠C meets AB in D (Fig. 6.17). Measure of ∠ADC is

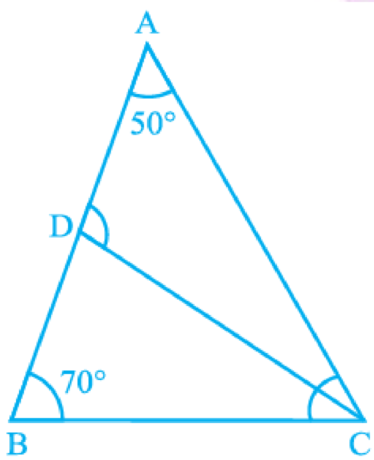


Fig. 6.17

(a) 50° **(b) 100°** **(c) 30°** **(d) 70°**

Solution:-

(b) 100^o

From the figure,

Consider the ΔABC,

We know that, sum of angles of triangle is equal to 180^o.

So, $\angle A + \angle B + \angle C = 180^o$

$50^o + 70^o + \angle C = 180^o$

$\angle C + 120^o = 180^o$

$\angle C = 180^o - 120^o$

$\angle C = 60^o$

Since CD bisects ∠C,

So, $\angle DCB = \angle ACD = ½ \angle C$

$= 60^o/2$

$= 30^o$

Now, consider ΔBDC

From exterior angle property, $\angle ACD = \angle DBC + \angle DCB$

$\angle ACD = 70^o + 30^o$

$= 100^o$

42. If for ΔABC and ΔDEF, the correspondence CAB ↔ EDF gives a congruence, then which of the following is not true?

(a) AC = DE **(b) AB = EF** **(c) ∠A = ∠D** **(d) ∠C = ∠E**

Solution: -

(b) AB = EF

Because, for ΔABC and ΔDEF AB = DE

43. In Fig. 6.18, M is the mid-point of both AC and BD. Then

(a) ∠1 = ∠2 **(b) ∠1 = ∠4** **(c) ∠2 = ∠4** **(d) ∠1 = ∠3**

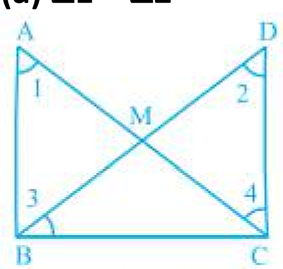


Fig. 6.18

Solution: -

(b) ∠1 = ∠4
From the figure, M is the mid-point of both AC and BD.
By the corresponding parts of congruent triangles, ∠1 = ∠4.

44. If D is the mid-point of the side BC in ΔABC where AB = AC, then ∠ADC is
(a) 60° **(b) 45°** **(c) 120s°** **(d) 90°**
Solution:-
(d) 90^o
We know that, in an isosceles triangle altitude and median are the same.
From the question, if D is the mid-point of the side BC in ΔABC
Where, D is midpoint of BC joining from point A gives AD as median.
It possess 90^o angle on BC
Therefore, ∠ADC = 90^o

45. Two triangles are congruent, if two angles and the side included between them in one of the triangles are equal to the two angles and the side included between them of the other triangle. This is known as the
(a) RHS congruence criterion
(b) ASA congruence criterion
(c) SAS congruence criterion
(d) AAA congruence criterion
Solution:-
(b) ASA congruence criterion

46. By which congruency criterion, the two triangles in Fig. 6.19 are congruent?
(a) RHS **(b) ASA** **(c) SSS** **(d) SAS**

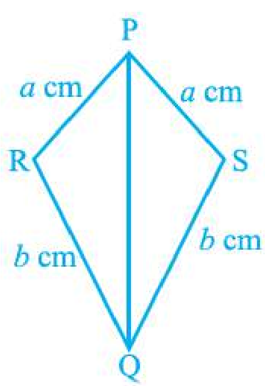


Fig. 6.19
Solution:-

(c) SSS
Under a given correspondence, two triangles are congruent, if the three sides of the one are equal to the three sides of the other.

47. By which of the following criterion two triangles cannot be proved congruent?
(a) AAA (b) SSS (c) SAS (d) ASA
Solution: -
(a) AAA
In AAA criterion two triangles cannot be proved congruent.

48. If ΔPQR is congruent to ΔSTU (Fig. 6.20), then what is the length of TU?
(a) 5 cm (b) 6 cm (c) 7 cm (d) cannot be determined

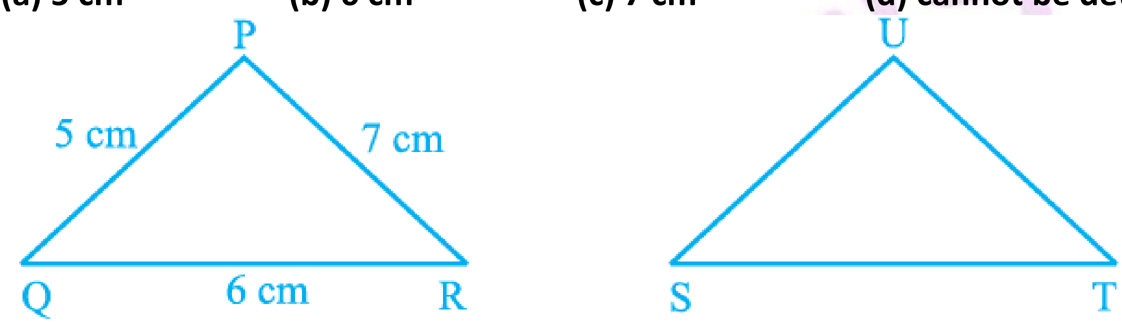


Fig. 6.20

Solution:-
(b) 6 cm
From the question it is given that,
Δ PQR ≅ Δ STU
So,
PQR ⟷ STU
∴ QR = TU
TU = 6cm

49. If ΔABC and ΔDBC are on the same base BC, AB = DC and AC = DB (Fig. 6.21), then which of the following gives a congruence relationship?
(a) Δ ABC ≅ Δ DBC (b) Δ ABC ≅ ΔCBD
(c) Δ ABC ≅ Δ DCB (d) Δ ABC ≅ ΔBCD
Solution:-
(c) Δ ABC ≅ Δ DCB
Consider the ΔABC and ΔDCB,

From the question it is given that, AB = DC and AC = DB
BC = BC … [because common side]
Therefore, Δ ABC ≅ Δ DCB

In questions 50 to 69, fill in the blanks to make the statements true.
50. The _________ triangle always has altitude outside itself.
Solution:-
The Obtuse triangle always has altitude outside itself.

51. The sum of an exterior angle of a triangle and its adjacent angle is always ___ _____.
Solution:-
The sum of an exterior angle of a triangle and its adjacent angle is always a right angle.

52. The longest side of a right angled triangle is called its _______________.
Solution: -
The longest side of a right angled triangle is called its hypotenuse.

53. Median is also called __________ in an equilateral triangle.
Solution:-
Median is also called altitude in an equilateral triangle

54. Measures of each of the angles of an equilateral triangle is ________________.
Solution: -
Measures of each of the angles of an equilateral triangle is 60^{o}.

55. In an isosceles triangle, two angles are always ________________.
Solution: -
In an isosceles triangle, two angles are always equal.

56. In an isosceles triangle, angles opposite to equal sides are ___________.
Solution: -
In an isosceles triangle, angles opposite to equal sides are equal.

57. If one angle of a triangle is equal to the sum of other two, then the measure of that angle is __________.
Solution: -

If one angle of a triangle is equal to the sum of other two, then the measure of that angle is <u>90^o</u>.

58. Every triangle has at least ______ acute angle (s).
Solution: -
Every triangle has at least <u>two</u> acute angle (s).

59. Two line segments are congruent, if they are of ________ lengths.
Solution: -
Two line segments are congruent, if they are of <u>equal</u> lengths.

60. Two angles are said to be _______, if they have equal measures.
Solution: -
Two angles are said to be <u>congruent</u>, if they have equal measures.

61. Two rectangles are congruent, if they have same and _________.
Solution: -
Two rectangles are congruent, if they have same and <u>length and breadth</u>.

62. Two squares are congruent, if they have same ______________.
Solution:-
Two squares are congruent, if they have same <u>side</u>.

63. If ΔPQR and ΔXYZ are congruent under the correspondence QPR ↔ XYZ, then
(i) ∠R =__________ (ii) QR =_________ (iii) ∠P =_________
(iv) QP =_________ (v) ∠ Q =_________ (vi) RP =_________
Solution: -
If ΔPQR and ΔXYZ are congruent under the correspondence QPR ↔ XYZ, then
(i) ∠R = <u>∠Z</u> (ii) QR = <u>XZ</u> (iii) ∠P = <u>∠Y</u>
(iv) QP = <u>XY</u> (v) ∠Q = ∠X (vi) RP = <u>ZY</u>

64. In Fig. 6.22, ΔPQR ≅ Δ__________

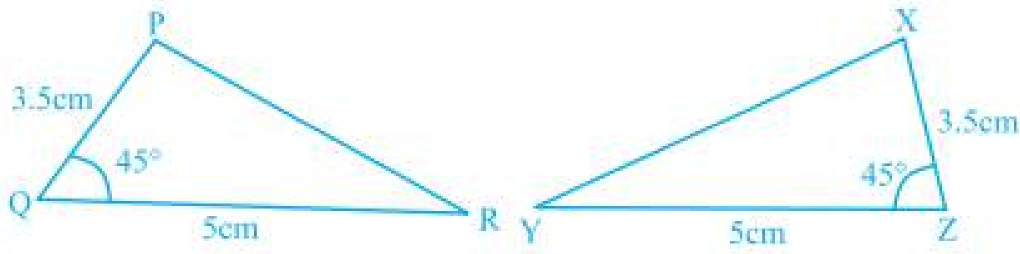


Fig. 6.22

Solution: -

In Fig. 6.22, ΔPQR ≅ Δ<u>XZY</u>

From the figure, PQ = XZ = 3.5 cm

QR = ZY = 5cm

∠PQR = ∠XZY = 45°

From SAS criterion, ΔPQR ≅ ΔXZY

65. In Fig. 6.23, ΔPQR ≅ Δ

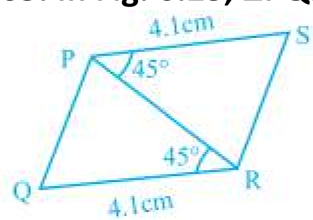


Fig. 6.23

Solution: -

In Fig. 6.23, ΔPQR ≅ Δ<u>RSP</u>

From the figure, PS = RQ = 4.1 cm

PR = PR … [common side for both triangles]

∠PRQ = ∠RPS = 45°

From SAS criterion, ΔPQR ≅ ΔXZY

66. In Fig. 6.24, Δ_______ ≅ Δ PQR

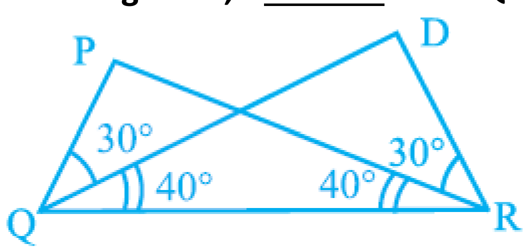


Fig. 6.24

Solution:-

In Fig. 6.24, ΔDRQ ≅ Δ PQR
From the figure,
QR = QR … [common side for both triangles]
∠PRQ = ∠DQR = 40°
∠PQR = ∠DRQ = 30°
From ASA criterion, ΔDRQ ≅ Δ PQR

67. In Fig. 6.25, Δ ARO ≅ Δ__________

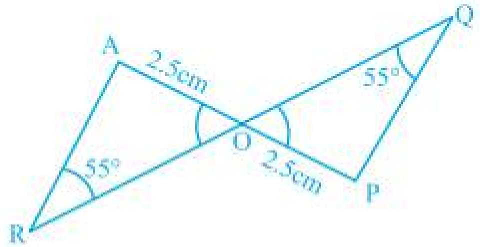


Fig. 6.25

Solution:-

In Fig. 6.25, Δ ARO ≅ ΔPQO
From the figure,
AO = PO = 2.5 cm
∠ARO = ∠OQP = 55°
∠AOR = ∠QOP [vertically opposite angles]
From ASA criterion, ΔDRQ ≅ Δ PQRS

68. In Fig. 6.26, AB = AD and ∠BAC = ∠ DAC.
Then (i) Δ________ ≅ Δ ABC.
(ii) BC = __________.
(iii) ∠BCA = ______.
(iv) Line segment AC bisects ________ and _______.

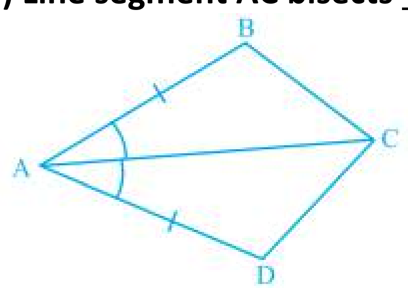


Fig. 6.26

Solution: -

In Fig. 6.26, AB = AD and ∠BAC = ∠ DAC.
Then (i) ΔADC ≅ Δ ABC.
(ii) BC = DC.
(iii) ∠BCA = ∠DCA.
(iv) Line segment AC bisects ∠BAD and ∠BCD.

69. In Fig. 6.27,
(i) ∠ TPQ = ∠ _____ + ∠ _____
(ii) ∠ UQR = ∠ _____ + ∠ _____
(iii) ∠ PRS = ∠ _____ + ∠ _____

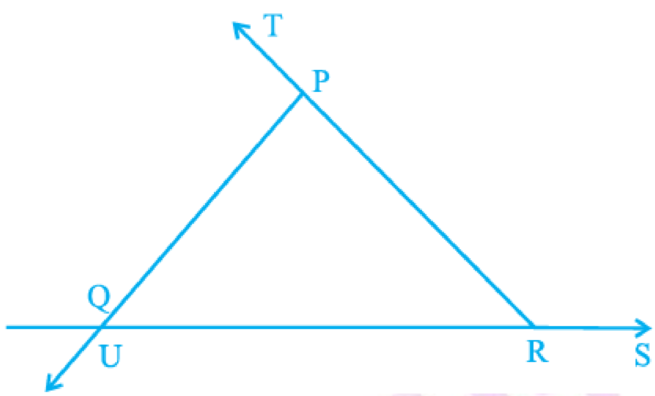


Fig. 6.27

Solution: -
In Fig. 6.27,
(i) ∠ TPQ = ∠ PQR + ∠ PRQ … [from exterior angle property]
(ii) ∠ UQR = ∠ QRP + ∠ QPR … [from exterior angle property]
(iii) ∠ PRS = ∠ RPQ + ∠ ROP … [from exterior angle property]

In questions 70 to 106 state whether the statements are True or False.
70. In a triangle, sum of squares of two sides is equal to the square of the third side.
Solution: -
False
In a right angled triangle, sum of squares of two sides is equal to the square of the third side.

71. Sum of two sides of a triangle is greater than or equal to the third side.
Solution: -
False
The sum of the lengths of any two sides of a triangle is always greater than the length of

the third side.

72. The difference between the lengths of any two sides of a triangle is smaller than the length of third side.

Solution: -

True.

73. In ΔABC, AB = 3.5 cm, AC = 5 cm, BC = 6 cm and in ΔPQR, PR= 3.5 cm, PQ = 5 cm, RQ = 6 cm. Then ΔABC ≅ ΔPQR.

Solution: -

False

In ΔABC, AB = 3.5 cm, AC = 5 cm, BC = 6 cm and in ΔPQR, PR= 3.5 cm, PQ = 5 cm, RQ = 6 cm. Then ΔABC ≅ ΔPRQ

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

Solution: -

False

Sum of any two angles of a triangle is either greater than the third angle or smaller than the third angle.

75. The sum of the measures of three angles of a triangle is greater than 180^o.

Solution: -

False

The sum of the measures of three angles of a triangle is equal to 180^o.

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

Solution: -

False

In a right angled triangle, sum of squares of two sides is equal to the square of the third side.

But, in equilateral triangle all sides are always equal.

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

Solution: -

True

In the figure, M is the midpoint,
So, AM = MB

78. It is possible to have a triangle in which two of the angles are right angles.
Solution: -
False.
It is not possible to have a triangle in which two of the angles are right angles.

79. It is possible to have a triangle in which two of the angles are obtuse.
Solution: -
False.
It is not possible to have a triangle in which two of the angles are obtuse

80. It is possible to have a triangle in which two angles are acute.
Solution: -
True.