MATHS

BOOKS - ICSE

THE TRIANGLE AND ITS PROPERTIES

Example

1. In ΔABC, a point P on BC divided BC in the ratio 1:1. what is the line segment joining vertex A and P called ?

A. Median

B. Altitude

C. Side

D. None of the above

Answer: A

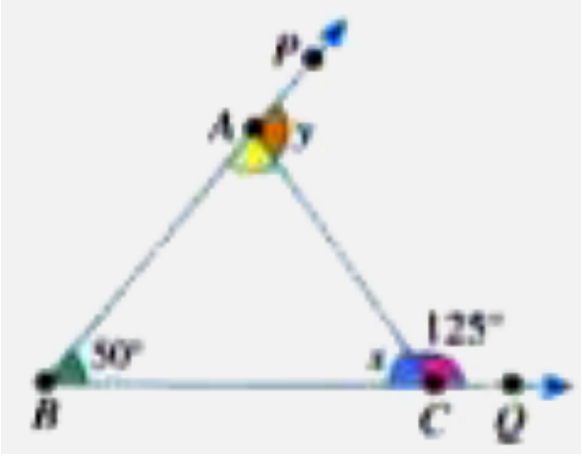
Watch Video Solution

2. In a ΔABC, P is a point on side BC. The line segment perpendicular to BC through the

point P has its end point as vertex A. what is the line segment PA called ?

Watch Video Solution

3. Find the values of x and y in the given figure.

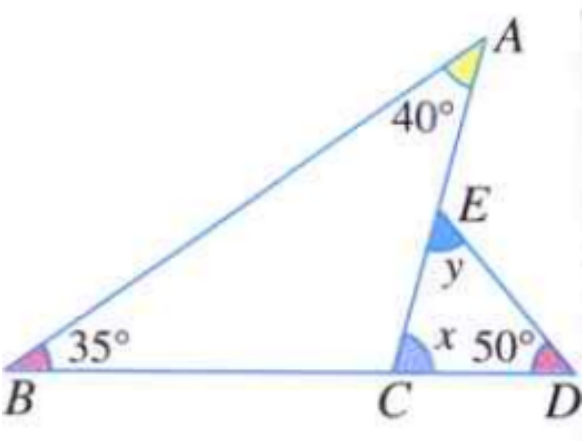


Watch Video Solution

4. One exterior angle of a triangle is 110°. Two two opposite interior angles are in the ratio 5:6. find the angles of the triangle.

Watch Video Solution

5. Find the values of x and y in the given figure.



Watch Video Solution

6. Two angles of a triangle are 58° and 44°. Find the third angle.

A. 89°

B. 68°

C. 76°

D. 78°

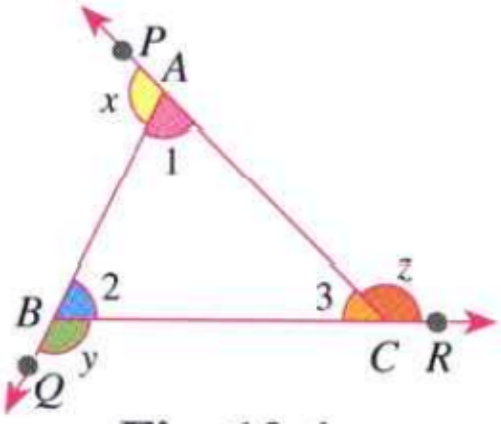
Answer: D

Watch Video Solution

7. A triangle ABC is such that $3\angle A = 4\angle B = 6\angle C$. Find the three angles.

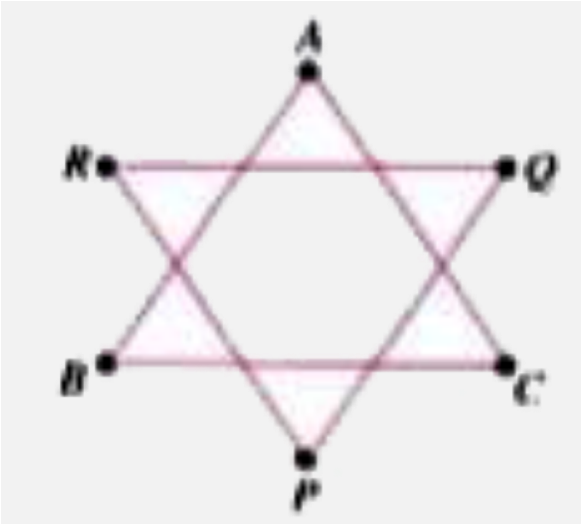
Watch Video Solution

8. In figure, find x+y+z.



Watch Video Solution

9. Find $\angle A + \angle B + \angle C + \angle P + \angle Q + \angle R$.



A. 360°.

B. 180°.

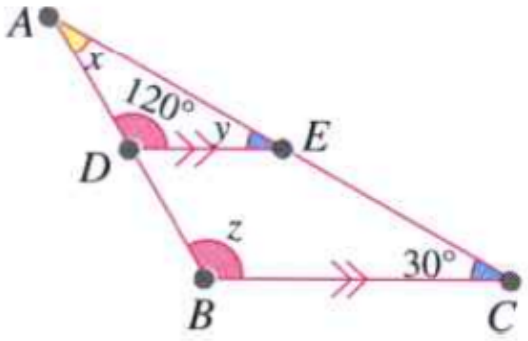
C. 90°.

D. 60°.

Answer: A

Watch Video Solution

10. In the given figure, find x,y and z.



A. $x = 20^\circ, y = 30^\circ, z = 110^\circ$.

B. $x = 30^\circ, y = 40^\circ, z = 130^\circ.$

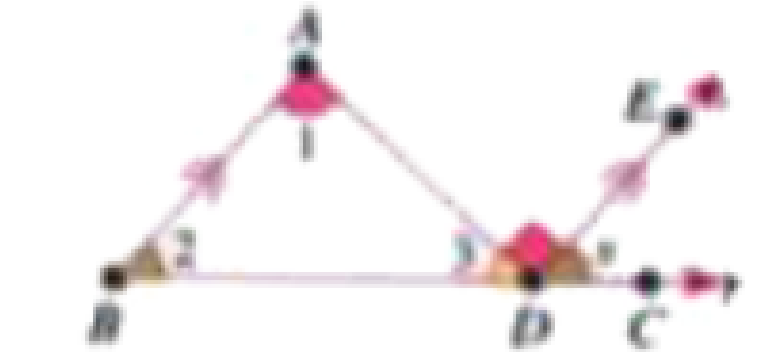
C. $x = 30^\circ, y = 30^\circ, z = 120^\circ.$

D. $x = 25^\circ, y = 45^\circ, z = 110^\circ.$

Answer: C

Watch Video Solution

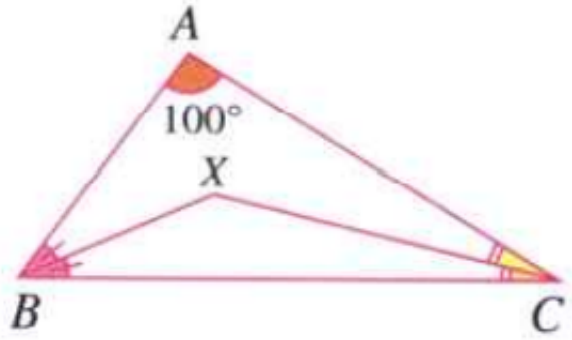
11. In the given figure, find x, given that $\angle 1 : \angle 2 : \angle 3 = 10 : 5 : 3.$



Watch Video Solution

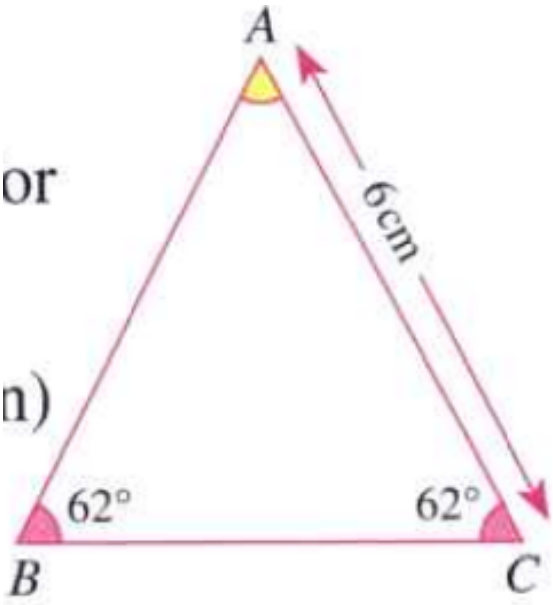
12. In $\Delta ABC, \angle = 100^\circ$. Line segment BX divides $\angle B$ into two equal parts and CX

divides $\angle C$ into two equal parts. Find $\angle BXC$.



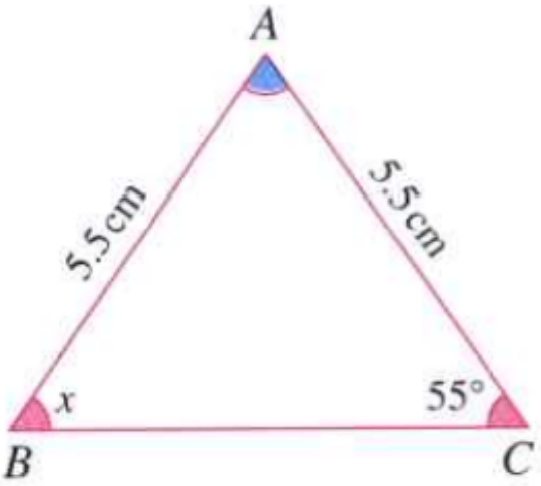
Watch Video Solution

13. Find the length of AB for the given ΔABC.



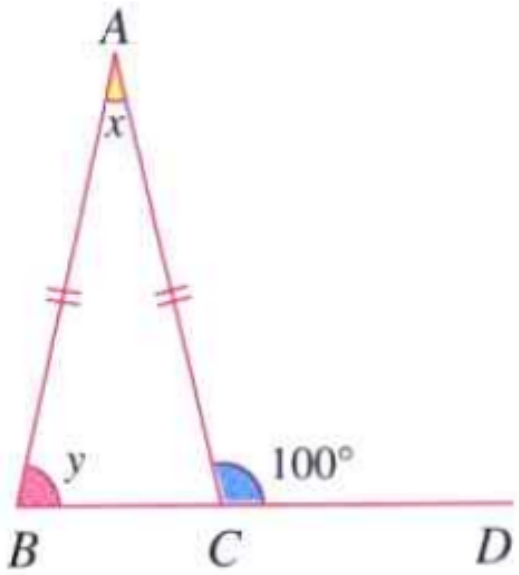
Watch Video Solution

14. Find the value of x.



Watch Video Solution

15. Find the values of x and y.



A. $x = 40^\circ$ and $y = 60^\circ$.

B. $x = 20^\circ$ and $y = 80^\circ$.

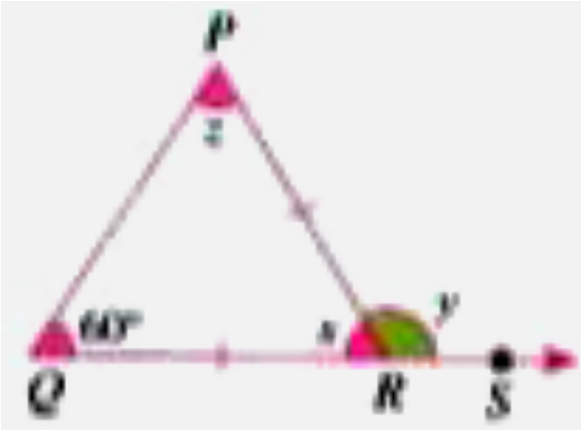
C. $x = 25^\circ$ and $y = 75^\circ$.

D. $x = 80^\circ$ and $y = 20^\circ$.

Answer: B

Watch Video Solution

16. Find the values of x,y and z in the given figure.



Watch Video Solution

17. It is possible to have a triangle with sides 9cm, 12cm, 16cm.

Watch Video Solution

18. Two sides of a triangle are 4 cm and 10 cm. what is the possible range of length of the third side ?

Watch Video Solution

19. Two sides of a isosceles triangle measure 3 cm and 7 cm. what is the measure of the third side ?

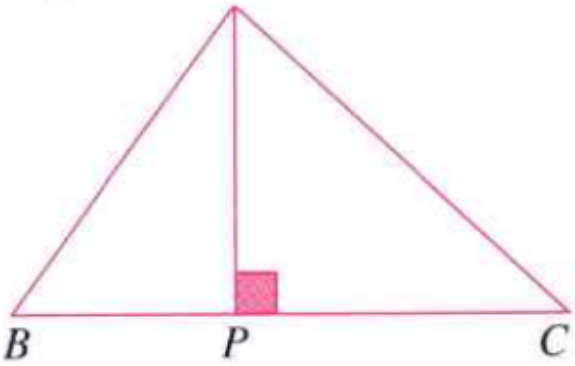
Watch Video Solution

20. The point O is outside the $\angle ABC$. Show that

$2(OA + OB + OC) > AB + BC + CA.$

Watch Video Solution

21. In ΔABC, line segment AP is the altitude through A. show that AB+BC+CA $> 2AP$

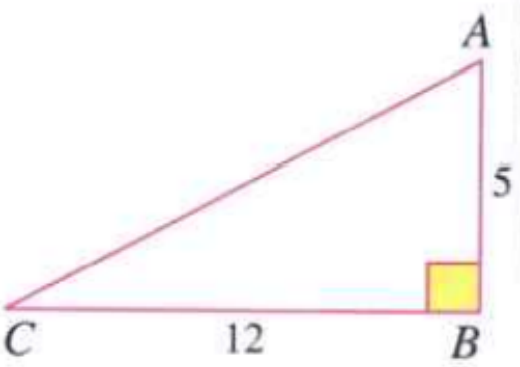


Watch Video Solution

22. Prove that in a quadrilateral the sum of all the sides is greater than the sum of its diagonals.

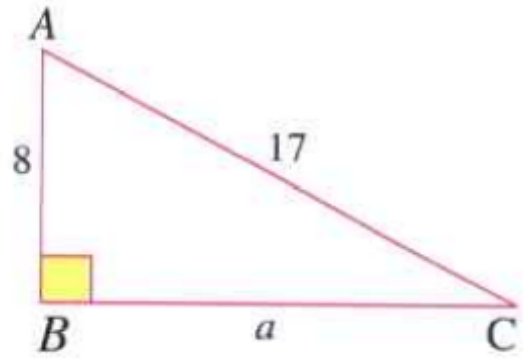
Watch Video Solution

23. Find the length of AC in the given figure.



Watch Video Solution

24. Find the length of side BC in the given triangle.



Watch Video Solution

25. An electric pole is 8 m high. A steel wire is tied from its top to A point on the ground at a distance of 8 m from the foot of the pole. What is the length of the wire ?

Watch Video Solution

26. A ladder 65 feet long is placed against a building and reaches a point that is 56 feet above the ground on one side of a street. Keeping the foot of the ladder at the same point, the ladder is turned to a building on the other side of the street. It now touches this building at a point 63 feet above the ground. find the width of the street.

Watch Video Solution

27. Find the perimeter of a rhombus whose diagonals are 30 cm and 40 cm.

Watch Video Solution

28. Can the lengths 15 cm, 8 cm, and 17 cm be the dimensions of a right triangle ?

Watch Video Solution

29. Three numbers a,b and c form a Phythagorean triplet. If a=5, b=12, find c if c is the largest of the three numbers.

Watch Video Solution

Warm Up Exercise

1. In the given triangle, name the following:

(a). The vertices of the triangle

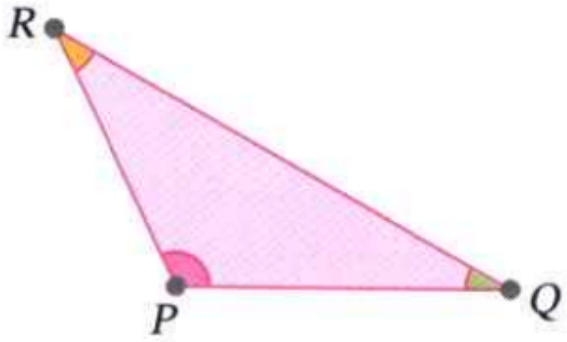
(b). The sides of the triangle

(c) the side opposite to vertex Q

(d) the vertex opposite to side PQ

(e) the three angles using three letters

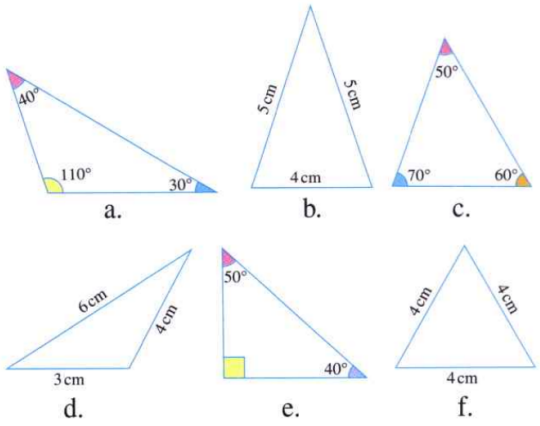
(f) the three angles using a single letter



Watch Video Solution

2. Identify the following triangles as equilateral, isosceles, scalene, acute-angled,

right-angled, and obtuse-angled triangles.



Watch Video Solution

3. Can an equilateral triangle be a, an acute-,b. a right-, and c. an obtuse-angled triangle ? What about isosceles and scalene triangles ?

Watch Video Solution

Try This

1. Given that LP is a median of the ΔLMN, explain where the point P lies.

Watch Video Solution

2. State true or false.

(a) A median of a triangle may lie outside the triangle.

(b). The medians of a triangle meet at more

than one points.

(c) The centroid of a triangle always lies inside the triangle.

Watch Video Solution

3. Draw a rought sketch of a right-angled triangle. Draw all the three altitudes of this triangle.

Watch Video Solution

4. State true or false.

(a) The altitude of an acute-angled triangle lies outside the triangle.

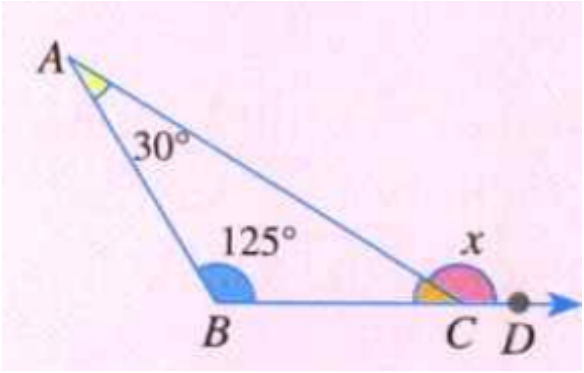
(b) the orthocentre of an obtuse-angled triangle lies outside the triangle.

(c) the orthocentre is the point of concurrency of three medians of a triangle.

(d) The vertex containing the right angle is also the orthocentre of a right-angled triangle.

Watch Video Solution

5. Find the value of x in the figure.



A. $x = 145^\circ$

B. $x = 155^\circ$

C. $x = 165^\circ$

D. $x = 175^\circ$

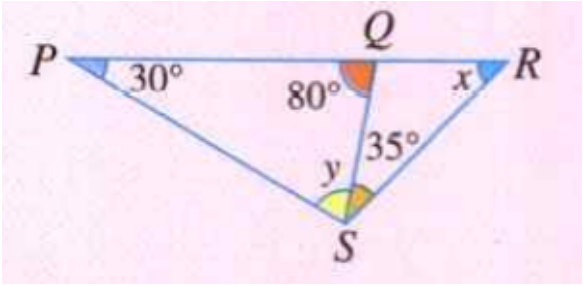
Answer: B

Watch Video Solution

6. One exterior angle of a triangle is 70°. The two opposite interior angles are in the ratio 2:5. find the angles of the triangle.

Watch Video Solution

7. In the given figure, find x and y.



Watch Video Solution

8. Find the third angle of a triangle, two of whose angles are 65° and 71°.

A. 84°.

B. 54°.

C. 44°.

D. 64°.

Answer: C

Watch Video Solution

9. One angle of a triangle is thrice the smallest angle and the other angle is five times the smallest angle. Find the three angles.

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

B. $40^\circ, 60^\circ, 110^\circ$.

C. $20^\circ, 60^\circ, 100^\circ$.

D. $50^\circ, 60^\circ, 100^\circ$.

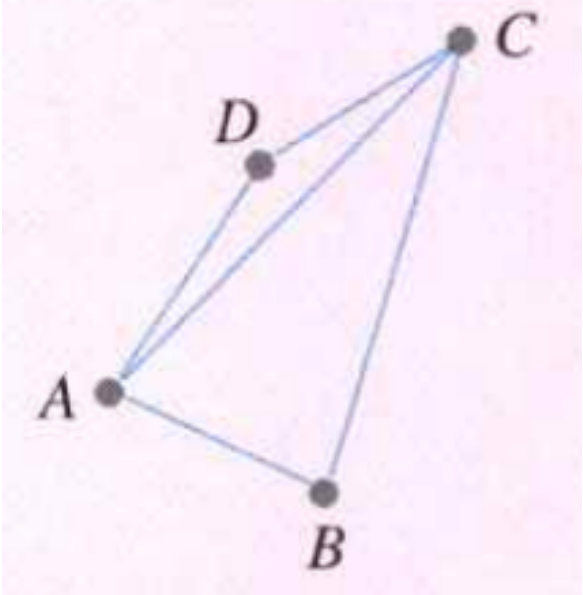
Answer: C

Watch Video Solution

10. In $\Delta ABC, \angle B = 90^\circ$ and AE and CF are the angle bisector (line segments that divide an angle into two equal parts) of $\angle A$ and $\angle C$, respectively. Find $\angle ADC$.

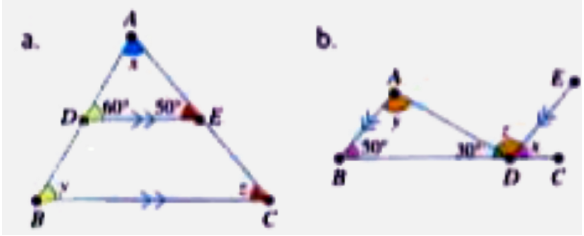
Watch Video Solution

11. Find $\angle A + \angle B + \angle C + \angle D$



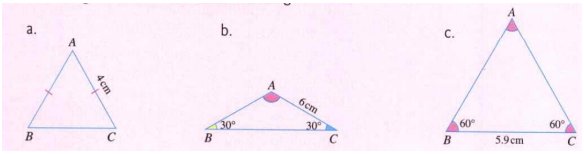
Watch Video Solution

12. Find the values of x,y, and z in the following figure.



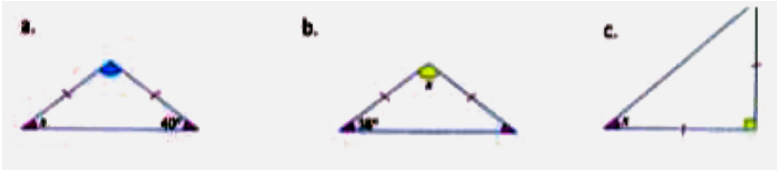
Watch Video Solution

13. Find the length of AB in each of the following



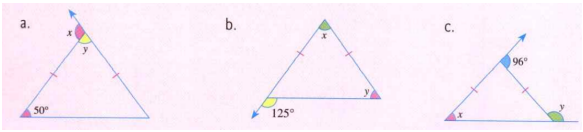
Watch Video Solution

14. Find the value of x in each of the following triangles.



Watch Video Solution

15. Find the values of



x and y.

Watch Video Solution

16. If one of the base angles of an isosceles triangle measures 30°, find the measures of the remaining two angles ?

A. $40^\circ, 110^\circ$.

B. $30^\circ, 120^\circ$.

C. $80^\circ, 40^\circ$.

D. $30^\circ, 100^\circ$.

Answer: B

Watch Video Solution

17. Can the lengths 5 cm, 9 cm, andd 13 cm be the dimensions of a triangle ?

Watch Video Solution

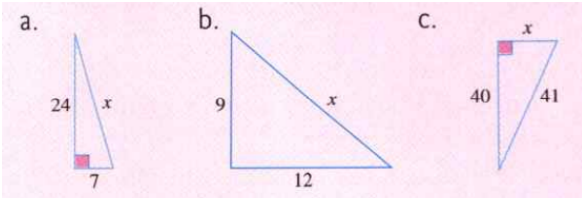
18. Two sides of an isosceles triangle are 4 cm and 7. what is the possible measure of the third side ?

Watch Video Solution

19. A point O lies inside a ΔABC. Show that $OA + OB + OC > \frac{1}{2}(AB + BC + CA)$.

Watch Video Solution

20. Find the value of x in each of the following figures.



Watch Video Solution

21. A ladder is placed with one edge on the wall 15 feet above the ground and the other end on the ground 8 feet away from the wall. Find the length of the ladder.

Watch Video Solution

22. Find the perimeter of a rhombus whose diagonals are 30 cm and 34 cm.

Watch Video Solution

23. Can the lengths 30 cm, 32 cm, and 16 cm be the dimensions of a right-angled triangle ?

Watch Video Solution

24. Three numbers a,b, and c form a Phythagorean triplet. If a=29, b=21, find c if c is the shortest of the three numbers.

Watch Video Solution

Exercise 12 1

1. What is the name of a line segment passing through a verrtex of a triangle to the midpoint of the opposite side ?

Watch Video Solution

2. Draw a triangle ABC to show a median through the vertex C.

Watch Video Solution

3. Out of acute-right-, and obtuse-angled triangles, which type of triangle(s) have their altitudes outside them? Draw a rough sketch to show each case.

Watch Video Solution

4. The exterior angle of a triangle is 105° and one of the interior opposite angles is 60°. Find the other two angles.

A. $45^\circ, 45^\circ$.

B. $25^\circ, 75^\circ$.

C. $45^\circ, 55^\circ$.

D. $45^\circ, 75^\circ$.

Answer: D

Watch Video Solution

5. The exterior angles of a triangle is 130° and the two interior opposite angle are in the ratio 6:7. find the angles of the triangle.

Watch Video Solution

6. Find the angles of a triangle whose interior and exterior angles are in the ratio of $2:7$. also, the other two interior angles are in the ratio of $3:4$.

A. $40^\circ, 60^\circ, 80^\circ$.

B. $40^\circ, 40^\circ, 60^\circ$.

C. $40^\circ, 70^\circ, 70^\circ$.

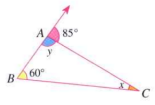
D. $30^\circ, 70^\circ, 80^\circ$.

Answer: A

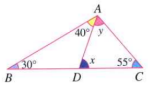
Watch Video Solution

7. Find the values of x and y in the gives figures.

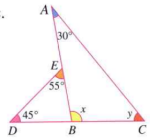
a.



b.



c.



Watch Video Solution

Exercise 12 2

1. One angle of a triangle is 45° and the other two are in the ratio 2:3. find these angles.

A. $50^\circ, 85^\circ$

B. $54^\circ, 81^\circ$

C. $54^\circ, 70^\circ$

D. $44^\circ, 81^\circ$

Answer: B

Watch Video Solution

2. One angle of a right-angled triangle is 38°.

Find the other angle.

A. 39°

B. 50°

C. 52°

D. 42°

Answer: C

Watch Video Solution

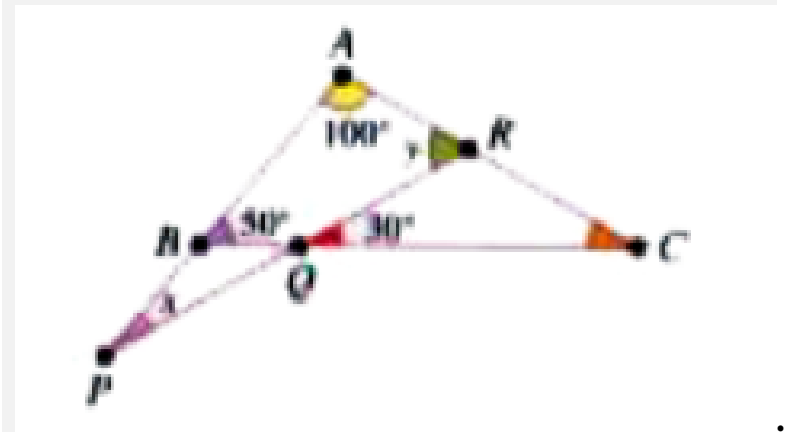
3. Can a triangle have a, two acute, b. two obtuse, and c. two right angles.

Watch Video Solution

4. Can an acute-angled triangled be a. and equilateral, b. an isosceles, and c. a scalene triangle ?

Watch Video Solution

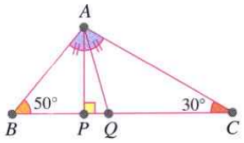
5. Find x and y in the gives figure.



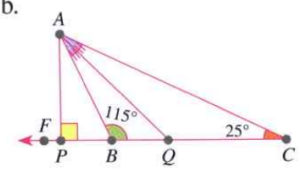
Watch Video Solution

6. In ΔABC, $AP \perp BC$ and AQ is the angle bisector of $\angle BAC$. Find $\angle PAQ$.

a.



b.



Watch Video Solution

7. Find a,b,c in the given figures.

Watch Video Solution

8. In the given figurs, line segment AB||CD. Find x,y, and z.

Watch Video Solution

9. Find the value of x and y in the figures given below.

Watch Video Solution

10. In a triangle ABC, sides AB and AC are of equal length. If $\angle B = 35^\circ$, find the measure of $\angle A$ and $\angle C$.

Watch Video Solution

11. In a triangle PQR, the side QR is extended to S to form the exteiror angle PRS of measure 120°. If the sides PQ and PR are equal, then prove that the triangle PQR is an equilateral triangle.

Watch Video Solution

Exercise 12 3

1. Find which of the following can be the dimensions of the sides of a triangle.

(a). 5 cm, 9 cm, 13 cm

(b) 6 cm, 8 cm, 15 cm

(c) 12 cm, 10 cm, 9 cm

(d) 3 cm, 7 cm, 3 cm.

Watch Video Solution

2. For a triangle ABC, fill in the blanks using >, <,+ in two different ways such that both are

correct :

(a). AB____BC___CA

(b) AB___BC___CA.

Watch Video Solution

3. A point A is inside a triangle PQR. Show that

$2(AP + AQ + AR) > PQ + QR + RP.$

Watch Video Solution

4. In ΔXYZ, XA is the altidue from X on YZ.

Show that XY+YZ+ZX>2XA.

Watch Video Solution

5. Find the value of x in the following figures.

Watch Video Solution

6. In ΔABC, $\angle C$ is a right angle, a and b are the legs and c is the hypotenuse. Find the third side if:

(a) a=6, b=8

(b) a=5, c=13

(c) b=24, c=25

(d) a=12, b=9

Watch Video Solution

7. Given are the lengths of three sides of a triangle in centimeters. Which of the following triplets can form a right-angled triangle ?

Watch Video Solution

8. A box has a base measuring 3 feet by 4 feet. Find the length of the largest rod that can be placed at the bottom of the box.

Watch Video Solution

9. The floor of a room measures 12 feet by 9 feet. Find the length of the largest rod that can be placed on the floor of the room.

Watch Video Solution

10. Find the length of the diagonal of a rectangle whose sides are 21 cm and 20 cm.

Watch Video Solution

11. The square of the diagonal of a square is 50 sq. units. Find the side of the square.

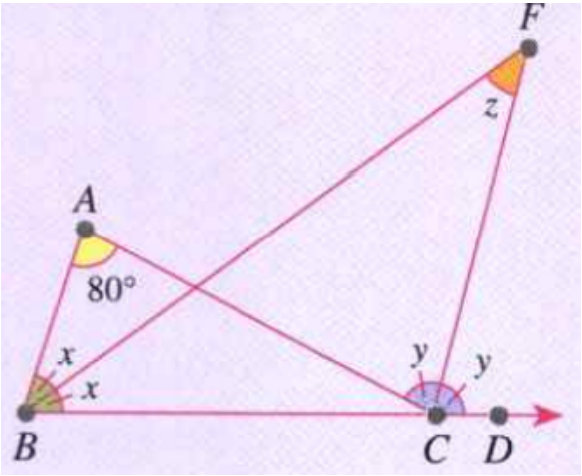
Watch Video Solution

12. Aman walked 63m due east. He then turned and walkeed for 16 m due north. How far is he from the starting point ?

Watch Video Solution

Challenge

1. In $\Delta ABC, \angle A = 80^\circ$, the bisectors of $\angle ABC$ and $\angle ACD$ meet at point F. find angle z?



Watch Video Solution

Revisions Exercise

1. In the given figure, name a median and an altitude.

Watch Video Solution

2. A median and an altitude of an obtuse-angled triangle lie outside the triangle. It is true ?

Watch Video Solution

3. Find the measure of the angles of a triangle which has one of its exterior angles of 120° and the two interior opposite angles in the ratio 1:2.

Watch Video Solution

4. Find the values of x and y in the given figure.

Watch Video Solution

5. Find the three angles of a triangle that are in the ratio 2:3:4.

Watch Video Solution

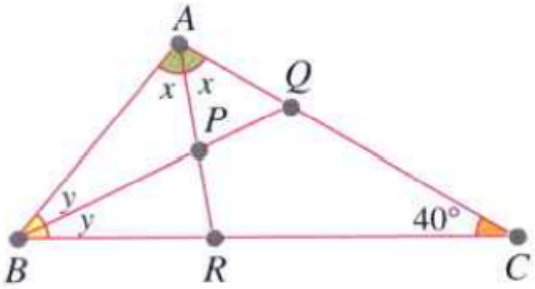
6. Find the values of x and y in the given figure.

Watch Video Solution

7. Find the values of x and y in the given figure.

Watch Video Solution

8. In $\Delta ABC, \angle C = 40^\circ, BQ$ and AR are the angle bisectors of $\angle B$ and $\angle A$, respectively. Find $\angle APQ$.

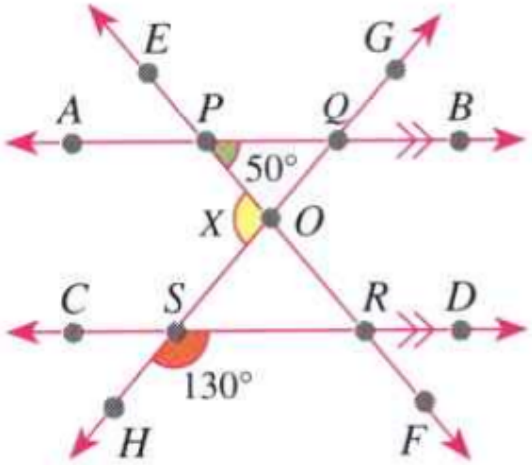


Watch Video Solution

9. Find the value of $\angle A + \angle B + \angle C + \angle D + \angle E$.

Watch Video Solution

10. Given AB||CD, EF and GH are transversal to AB and CD. Find x.



Watch Video Solution

11. The sides of a triangle are 6 cm, 10 cm, and a cm. where a is a whole number. Find the minimum and maximum value that a can take.

Watch Video Solution

12. Find the third side of an isosceles triangle whose two sides are 9 cm and 4 cm.

Watch Video Solution

13. In a right-angled triangle, the square of the longest side is 625 sq. cm. if the length of the second side is 7 cm, find the length of the third side of the triangle.

Watch Video Solution

14. Two poles of height 13 feet and 25 feet are standing at two ends of a 35 feet wide street. Find the distance between their tops.

Watch Video Solution

15. Find the length AB using Phythagoras' theorem.

Watch Video Solution