NCERT Solutions for Class 7 Maths Chapter 6 The Triangle and its Properties Ex 6.5

Ex 6.5 Class 7 Maths Question 1.

PQR is a triangle, right angled at P. If PQ = 10 cm and PR = 24 cm, find QR.



Solution:

In right angled triangle PQR, we have $QR^2 = PQ^2 + PR^2$ From Pythagoras property) = $(10)^2 + (24)^2$ = 100 + 576 = 676

 \therefore QR = $\sqrt{676}$ = 26 cm

The, the required length of QR = 26 cm.

Ex 6.5 Class 7 Maths Question 2.

ABC is a triangle, right angled at C. If AB = 25 cm and AC = 7 cm, find BC.



Solution:

In right angled \triangle ABC, we have BC² + (7)² = (25)² (By Pythagoras property) \Rightarrow BC² + 49 = 625 \Rightarrow BC² = 625 - 49 \Rightarrow BC² = 576 \therefore BC = $\sqrt{576}$ = 24 cm Thus, the required length of BC = 24 cm. Ex 6.5 Class 7 Maths Question 3.

A 15 m long ladder reached a window 12 m high from the ground on placing it against a wall at a distance a. Find the distance of the foot of the ladder from the wall.



Solution:

Here, the ladder forms a right angled triangle. $\therefore a^{2} + (12)^{2} = (15)^{2} (By Pythagoras property)$ $\Rightarrow a^{2} + 144 = 225$ $\Rightarrow a^{2} = 225 - 144$ $\Rightarrow a^{2} = 81$ $\therefore a = \sqrt{81} = 9 \text{ m}$

Thus, the distance of the foot from the ladder = 9m

Ex 6.5 Class 7 Maths Question 4.

Which of the following can be the sides of a right triangle?

(i) 2.5 cm, 6.5 cm, 6 cm.

(ii) 2 cm, 2 cm, 5 cm.

(iii) 1.5 cm, 2 cm, 2.5 cm

Solution:

(i) Given sides are 2.5 cm, 6.5 cm, 6 cm.

Square of the longer side = $(6.5)^2$ = 42.25 cm.

Sum of the square of other two sides

$$= (2.5)^2 + (6)^2 = 6.25 + 36$$

= 42.25 cm.

Since, the square of the longer side in a triangle is equal to the sum of the squares of other two sides.

 \div The given sides form a right triangle.

(ii) Given sides are 2 cm, 2 cm, 5 cm .

Square of the longer side = $(5)^2$ = 25 cm Sum of the square of other two sides

 $= (2)^2 + (2)^2 = 4 + 4 = 8 \text{ cm}$

Since 25 cm ≠ 8 cm

 \therefore The given sides do not form a right triangle.

(iii) Given sides are 1.5 cm, 2 cm, 2.5 cm Square of the longer side = $(2.5)^2$ = 6.25 cm Sum of the square of other two sides = $(1.5)^2 + (2)^2 = 2.25 + 4$

Since 6.25 cm = 6.25 cm = 6.25 cm

Since the square of longer side in a triangle is equal to the sum of square of other two sides.

 \therefore The given sides form a right triangle.

Ex 6.5 Class 7 Maths Question 5.

A tree is broken at a height of 5 m from the ground and its top touches the ground at a distance of 12 m from the base of the tree . Find the original height of the tree. Solution:

Let AB be the original height of the tree and broken at C touching the ground at D such that



AC = 5 m and AD = 12 m In right triangle \triangle CAD, AD² + AC² = CD² (By Pythagoras property) $\Rightarrow (12)^2 + (5)^2 = CD^2$ $\Rightarrow 144 + 25 = CD^2$ $\Rightarrow 169 = CD^2$ $\therefore CD = \sqrt{169} = 13 m$ But CD = BC AC + CB = AB 5 m + 13 m = AB $\therefore AB = 18 m$. Thus, the original height of the tree = 18 m. Ex 6.5 Class 7 Maths Question 6.

Angles Q and R of a APQR are 25° and 65°. Write which of the following is true.

(i) $PQ^2 + QR^2 = RP^2$ (ii) $PQ^2 + RP^2 = QR^2$ (iii) $RP^2 + QR^2 = PQ^2$



Solution:

We know that

 $\angle P + \angle Q + \angle R = 180^{\circ}$ (Angle sum property)

∠P + 25° + 65° = 180°

∠P + 90° = 180°

∠P = 180° - 90° - 90°

 Δ PQR is a right triangle, right angled at P

(i) Not True

 \therefore PQ² + QR² ≠ RP² (By Pythagoras property)

(ii) True

 \therefore PQ² + RP² = QP² (By Pythagoras property)

(iii) Not True

 $\therefore RP^2 + QR^2 \neq PQ^2 \text{ (By Pythagoras property)}$

Ex 6.5 Class 7 Maths Question 7.

Find the perimeter of the rectangle whose length is 40 cm and a diagonal is 41 cm.



Solution: Given: Length AB = 40 cm Diagonal AC = 41 cm In right triangle ABC, we have $AB^2 + BC^2 = AC^2$ (By Pythagoras property) $\Rightarrow (40)^2 + BC^2 = (41)^2$ $\Rightarrow 1600 + BC^2 = 1681$ $\Rightarrow BC^2 = 1681 - 1600$ $\Rightarrow BC^2 = 81$ $\therefore BC = \sqrt{81} = 9$ cm $\therefore AB = DC = 40$ cm and BC = AD = 9 cm (Property of rectangle) \therefore The required perimeter = AB + BC + CD + DA = (40 + 9 + 40 + 9) cm = 98 cm

Ex 6.5 Class 7 Maths Question 8.

The diagonals of a rhombus measure 16 cm and 30 cm. Find its perimeter.



Solution:

Let ABCD be a rhombus whose diagonals intersect each other at O such that AC = 16 cm and BD = 30 cm Since, the diagonals of a rhombus bisect each other at 90°.

:: OA = OC = 8 cm and OB = OD = 15 cm

In right ΔOAB ,

 $AB^2 = OA^2 + OB^2$ (By Pythagoras property)

= $(8)^{2}$ + $(15)^{2}$ = 64 + 225= 289 :: AB = $\sqrt{289}$ = 17 cm Since AB = BC = CD = DA (Property of rhombus) :: Required perimeter of rhombus = $4 \times side = 4 \times 17 = 68$ cm.