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

Ex 6.5 Class 7 Maths Question 1.
$P Q R$ is a triangle, right angled at $P$. If $P Q=10 \mathrm{~cm}$ and $P R=24 \mathrm{~cm}$, find $Q R$.


## Solution:

In right angled triangle PQR, we have
$Q^{2}=P Q^{2}+P R^{2}$ From Pythagoras property)
$=(10)^{2}+(24)^{2}$
$=100+576=676$
$\therefore \mathrm{QR}=\sqrt{676}=26 \mathrm{~cm}$
The, the required length of $Q R=26 \mathrm{~cm}$.

Ex 6.5 Class 7 Maths Question 2.
$A B C$ is a triangle, right angled at $C$. If $A B=25 \mathrm{~cm}$ and $A C=7 \mathrm{~cm}$, find $B C$.


Solution:
In right angled $\triangle A B C$, we have
$B C^{2}+(7)^{2}=(25)^{2}$ (By Pythagoras property)
$\Rightarrow B C^{2}+49=625$
$\Rightarrow B C^{2}=625-49$
$\Rightarrow B C^{2}=576$
$\therefore \mathrm{BC}=\sqrt{576}=24 \mathrm{~cm}$
Thus, the required length of $B C=24 \mathrm{~cm}$.

## 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.
$\therefore \mathrm{a}^{2}+(12)^{2}=(15)^{2}$ (By Pythagoras property)
$\Rightarrow a^{2}+144=225$
$\Rightarrow \mathrm{a} 2=225-144$
$\Rightarrow a^{2}=81$
$\therefore \mathrm{a}=\sqrt{81}=9 \mathrm{~m}$
Thus, the distance of the foot from the ladder $=9 \mathrm{~m}$
Ex 6.5 Class 7 Maths Question 4.
Which of the following can be the sides of a right triangle?
(i) $2.5 \mathrm{~cm}, 6.5 \mathrm{~cm}, 6 \mathrm{~cm}$.
(ii) $2 \mathrm{~cm}, 2 \mathrm{~cm}, 5 \mathrm{~cm}$.
(iii) $1.5 \mathrm{~cm}, 2 \mathrm{~cm}, 2.5 \mathrm{~cm}$

Solution:
(i) Given sides are $2.5 \mathrm{~cm}, 6.5 \mathrm{~cm}, 6 \mathrm{~cm}$.

Square of the longer side $=(6.5)^{2}=42.25 \mathrm{~cm}$.
Sum of the square of other two sides
$=(2.5)^{2}+(6)^{2}=6.25+36$
$=42.25 \mathrm{~cm}$.
Since, the square of the longer side in a triangle is equal to the sum of the squares of other two sides.
$\therefore$ The given sides form a right triangle.
(ii) Given sides are $2 \mathrm{~cm}, 2 \mathrm{~cm}, 5 \mathrm{~cm}$.

Square of the longer side $=(5)^{2}=25 \mathrm{~cm}$ Sum of the square of other two sides
$=(2)^{2}+(2)^{2}=4+4=8 \mathrm{~cm}$
Since $25 \mathrm{~cm} \neq 8 \mathrm{~cm}$
$\therefore$ The given sides do not form a right triangle.
(iii) Given sides are $1.5 \mathrm{~cm}, 2 \mathrm{~cm}, 2.5 \mathrm{~cm}$

Square of the longer side $=(2.5)^{2}=6.25 \mathrm{~cm}$ Sum of the square of other two sides
$=(1.5)^{2}+(2)^{2}=2.25+4$
Since $6.25 \mathrm{~cm}=6.25 \mathrm{~cm}=6.25 \mathrm{~cm}$
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 $A B$ be the original height of the tree and broken at $C$ touching the ground at $D$ such that

$A C=5 m$
and $A D=12 \mathrm{~m}$
In right triangle $\triangle C A D$,
$A D^{2}+A C^{2}=C D^{2}$ (By Pythagoras property)
$\Rightarrow(12)^{2}+(5)^{2}=C D^{2}$
$\Rightarrow 144+25=C D^{2}$
$\Rightarrow 169=C D^{2}$
$\therefore C D=\sqrt{169}=13 \mathrm{~m}$
But CD $=B C$
$A C+C B=A B$
$5 m+13 m=A B$
$\therefore \mathrm{AB}=18 \mathrm{~m}$.
Thus, the original height of the tree $=18 \mathrm{~m}$.

Ex 6.5 Class 7 Maths Question 6.
Angles $Q$ and $R$ of a $A P Q R$ are $25^{\circ}$ and $65^{\circ}$. Write which of the following is true.
(i) $P Q^{2}+Q R^{2}=R P^{2}$
(ii) $P Q^{2}+R P^{2}=Q R^{2}$
(iii) $R P^{2}+Q R^{2}=P Q^{2}$


Solution:
We know that
$\angle P+\angle Q+\angle R=180^{\circ}$ (Angle sum property)
$\angle P+25^{\circ}+65^{\circ}=180^{\circ}$
$\angle P+90^{\circ}=180^{\circ}$
$\angle P=180^{\circ}-90^{\circ}-90^{\circ}$
$\triangle \mathrm{PQR}$ is a right triangle, right angled at P
(i) Not True
$\therefore \mathrm{PQ}^{2}+\mathrm{QR}^{2} \neq \mathrm{RP}^{2}$ (By Pythagoras property)
(ii) True
$\therefore \mathrm{PQ}^{2}+\mathrm{RP}^{2}=\mathrm{QP}^{2}$ (By Pythagoras property)
(iii) Not True
$\therefore \mathrm{RP}^{2}+\mathrm{QR}^{2} \neq \mathrm{PQ}^{2}$ (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 $\mathrm{AB}=40 \mathrm{~cm}$
Diagonal $A C=41 \mathrm{~cm}$
In right triangle $A B C$, we have
$A B^{2}+B C^{2}=A C^{2}$ (By Pythagoras property)
$\Rightarrow(40)^{2}+B C^{2}=(41)^{2}$
$\Rightarrow 1600+\mathrm{BC}^{2}=1681$
$\Rightarrow B C^{2}=1681-1600$
$\Rightarrow B C^{2}=81$
$\therefore B C=\sqrt{81}=9 \mathrm{~cm}$
$\therefore A B=D C=40 \mathrm{~cm}$ and $B C=A D=9 \mathrm{~cm}$ (Property of rectangle)
$\therefore$ The required perimeter
$=A B+B C+C D+D A$
$=(40+9+40+9) \mathrm{cm}$
$=98 \mathrm{~cm}$

## Ex 6.5 Class 7 Maths Question 8.

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


## Solution:

Let $A B C D$ be a rhombus whose diagonals intersect each other at $O$ such that $A C=16 \mathrm{~cm}$ and $B D=30 \mathrm{~cm}$ Since, the diagonals of a rhombus bisect each other at $90^{\circ}$.
$\therefore O A=O C=8 \mathrm{~cm}$ and $O B=O D=15 \mathrm{~cm}$
In right $\triangle O A B$,
$A B^{2}=O A^{2}+O B^{2}$ (By Pythagoras property)
$=(8)^{2}+(15)^{2}=64+225$
$=289$
$\therefore A B=\sqrt{289}=17 \mathrm{~cm}$
Since $A B=B C=C D=D A$ (Property of rhombus)
$\therefore$ Required perimeter of rhombus
$=4 \times$ side $=4 \times 17=68 \mathrm{~cm}$.

