TRIANGLES

PYTHAGOREAN THEOREM

EXERCISE

Q.1 Side of a triangle is given, determine it is a right triangle.

$(2a - 1)$ cm, $2\sqrt{2a}$ cm and $(2a + 1)$ cm

Q.2 A man goes 10 m due east and then 24 m due north. Find the distance from the starting point.

Q.3 Two towers of heights 10 m and 30 m stand on a plane ground. If the distance between their feet is 15 m, find the distance between their tops.

Q.4 In Fig., ΔABC is an obtuse triangle, obtuse angled at B. If $AD \perp CB$, prove that

$AC^2 = AB^2 + BC^2 + 2BC \times BD$

Q.5 In figure, $\angle B$ of ΔABC is an acute angle and $AD \perp BC$, prove that

$AC^2 = AB^2 + BC^2 - 2BC \times BD$

Q.6 If ABC is an equilateral triangle of side a, prove that its altitude $= \frac{\sqrt{3}}{2}$ a.

Q.7 ABC is a right-angled triangle, right-angled at A. A circle is inscribed in it. The lengths of the two sides containing the right angle are 5 cm and 12 cm. Find the radius of the circle.

Q.8 ABCD is a rhombus. Prove that

$AB^2 + BC^2 + CD^2 + DA^2 = AC^2 + BD^2$

Q.9 P and Q are the mid-points of the sides CA and CB respectively of a ΔABC, right angled at C. Prove that :

(i) $4AQ^2 = 4AC^2 + BC^2$

(ii) $4BP^2 = 4BC^2 + AC^2$

(iii) $(4AQ^2 + BP^2) = 5AB^2$

Q.10 In a right triangle ABC right-angled at C, P and Q are the points on the sides CA and CB respectively, which divide these sides in the ratio 2 : 1. Prove that

(i) $9\ AQ^2 = 9\ AC^2 + 4\ BC^2$

(ii) $9\ BP^2 = 9\ BC^2 + 4\ AC^2$

(iii) $9\ (AQ^2 + BP^2) = 13\ AB^2$

ANSWER KEY

2 26 m

3 25 m.

7 $r = 2$ cm