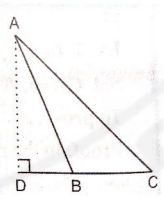
PYTHGORAS THEOREM

EXERCISE

1. In ΔABC, $\angle B$=90°, AB =18cm; BC =24 cm; Calculate the length of AC.
2. a man goes 150m due east and then 200m due north. How far is he from the starting point?
3. A ladder is placed in such a way that its foot is at a distance of 5m from a wall and its top reaches a window 12m above the ground. Determine the length of the ladder.
4. A ladder 50dm long is placed so as to reach a window 48 dm high and on turning th ladder over to the other side of the street, it reaches a point 14dm high. Find the breadth of the street.
5. The sides of certain triangles are given below. Determine which of them is a right triangle.
   (i) 7cm, 24cm, 25 cm
   (ii) 8cm, 15c, 17cm
   (iii) 5cm, 8cm, 11cm
6. is point of intersection of the diagonals AC and BD of a rhombus ABCD. P, Q, R are points on OC, OB and OA respectively such that OP =1 unit, OQ = 2 units and OR = 4 units.
   Prove that the angle PQR is a right angle.
7. ABC is an isosceles triangle right angled at C, Prove that $AB^2 = 2AC^2$
8. In a ΔABC, AD⊥BC. Prove that $AB^2 - BD^2 = AC^2 - CD^2$.
9. P is any point inside a rectangle ABCD, prove that $PA^2 + PC^2 = PB^2 + PD^2$.
10. P and Q are points on the side CA and CB respectively of a Δ ABC, right angled at C, Prove that $AQ^2 + BP^2 = AB^2 + PQ^2$.
11. In Fig. Δ ABC is an obtuse triangle, obtuse angled at B, If AD⊥CB, prove that $AC^2 = AB^2 + BC^2 + 2BC.\ BD$.



12. In an equilateral triangle with side a, prove that

i) Altitude $= \frac{a\sqrt{3}}{2}$

ii) Area $= \frac{\sqrt{3}}{4} a^2$

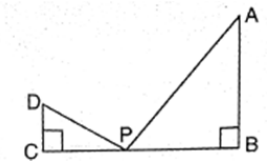
13. In △PQR, QM ⊥ PR and $PR^2 - PQ^2 = QR^2$. Prove that QM^2 = PM x MR.

Pythagoras Theorem [Proof and Simple Applications with Converse]

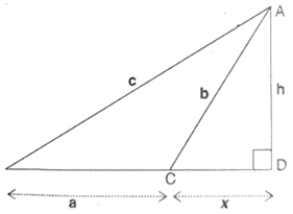
MATHEMATICS

EXERCISE

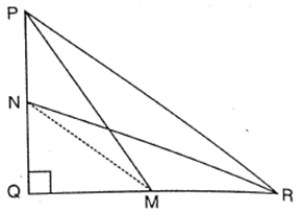
1. A ladder reaches a window which is 15 meters above the ground on one side of the street. Keeping its foot at the same point, the ladder is turned to the other side of the street to reach a window 8 meter high. Find the width of the street, if the length of the ladder is 17 meters.
2. In the given diagram, AB = 3CD = 18 cm and 3BP = 4CP = 36 cm. show that the measure of angle APD is 90°



3. In the given figure; AD is perpendicular to BC produced. Prove that: $c^2=a^2 + b^2 + 2ax$

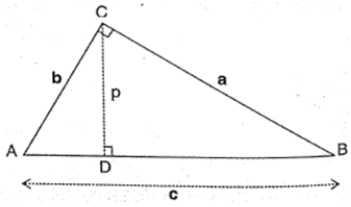


4. M and N are points on sides QR and PQ respectively of a △PQR, right-angled at Q. prove that: $PM^2 + RN^2 = PR^2 + MN^2$



5. In triangle ABC, ∠ACB =90°, AB =c unit, BC = a unit, AC=b unit, CD is perpendicular to AB and CD = p unit.

Prove that : $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

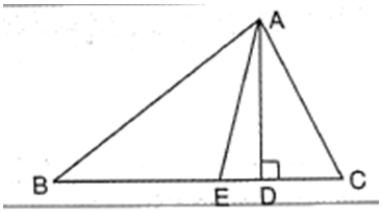


6. ABC is an equilateral triangle, P is a point in BC such that BP: PC = 2 : 1.

   Prove that : $9\ AP^2 = 7\ AB^2$

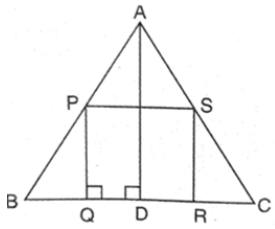
7. The given figure shows a triangle ABC, in which AB >AC. E is the mid-point of BC and AD is perpendicular to BC.

   Prove that: $AB^2 - AC^2 = 2BC \times ED$



8. ABC is an isosceles triangle in which AB = AC = 20cm and BC = 24cm . PQRS is a rectangle drawn inside the isosceles triangle. Given PQ = SR = y cm and PS =QR =2x cm.

   Prove that : $y = 16 - \frac{4x}{3}$



9. Prove that the sum of the squares on the diagonals of a parallelogram is equal to the sum of the squares on its sides.