

# Assignment No.1

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Download all python codes from

<https://github.com/Vallidevibolla/bolla1.git>

and latex-tikz codes from

<https://github.com/Vallidevibolla/bolla1.git>

## 1 QUESTION No.13

In Fig.  $\triangle ABD$  is a right triangle, right angled at A and  $AC \perp BD$ . Prove that  $AB^2 = BC \cdot BD$ .

### 2 SOLUTION

$$\text{In } \triangle ABD, AB^2 + AD^2 = BD^2 \text{ --- (1)}$$

$$\text{In } \triangle ABC, AC^2 + BC^2 = AB^2 \text{ --- (2)}$$

$$\text{In } \triangle ACD, AC^2 + CD^2 = AD^2 \text{ --- (3)}$$

$$\text{Subtracting (3) from (2) } AB^2 - AD^2 = BC^2 - CD^2 \text{ --- (4)}$$

$$\text{Adding 1 and 4 } 2AB^2 = BC^2 + BD^2 - CD^2$$

$$2AB^2 = (BC + CD)^2 + BC^2 - CD^2$$

$$\text{Since } BD = BC + CD \quad 2AB^2 = 2BC^2 + 2BC \cdot CD$$

$$2AB^2 = (BC + CD)2BC$$

$$AB^2 = BC \cdot BD$$

Hence it is proved that  $AB^2 = BC \cdot BD$

□

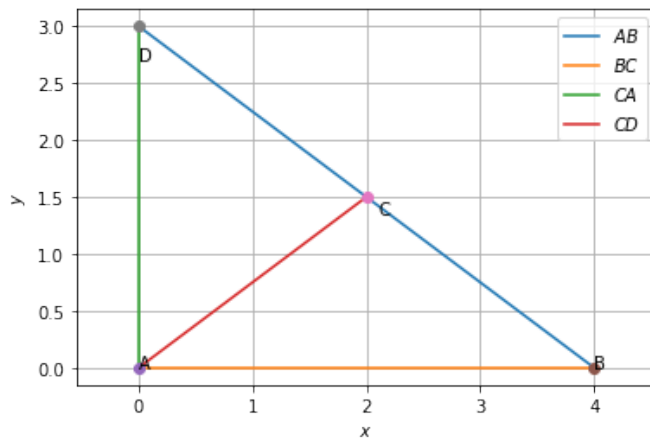


Fig. 0: Right angled triangle

## 3 2.QUESTION 9

In Fig.  $\triangle ABC$  is circumscribing a circle. Find the length of BC.

## 4 SOLUTION

Given  $BR = 3\text{cm}$   $AR = 4\text{cm}$   $AC = 11\text{cm}$

$BP = BR$

$AQ = AR$

$CP = CQ$

(Because length of tangents to circle from external point will be equal)

Therefore

$AQ = 4\text{cm}$   $BP = 3\text{cm}$

As  $AC = 11\text{cm}$

$QC + AQ = 11\text{cm}$   $QC = 11 - AQ$

$QC = 7\text{cm}$   $PC = 7\text{cm}$

$BC = BP + PC$

$BC = 3 + 7$   $BC = 10\text{cm}$

The length of BC is 10cm