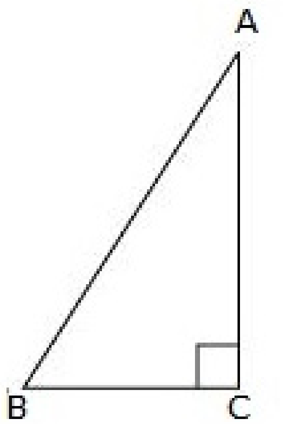
Exercise 4D

Question 8:

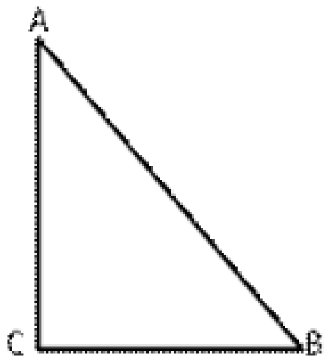
Given: ΔABC is a right angled isosceles triangle in which $\angle ACB = 90^\circ$



$$AB^2 = AC^2 + BC^2$$
$$\Rightarrow AB^2 = AC^2 + AC^2$$
$$\left[(\because AB = AC)\text{ Given}\right]$$
$$\Rightarrow AB^2 = 2AC^2$$

Question 9:

Given: ΔABC is an isosceles triangle with $AC = BC$ and $AB^2 = 2AC^2$



$$AB^2 = 2AC^2 \Rightarrow AB^2 = AC^2 + AC^2$$
$$\Rightarrow AB^2 = AC^2 + BC^2$$
$$[\because AC = BC]$$

ΔABC is a right triangle right angled at C.

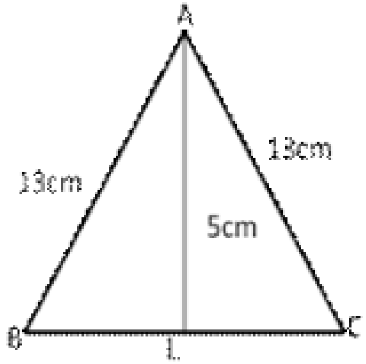
(by converse of Pythagoras theorem)

Question 10:

Given: ΔABC is an isosceles triangle with AB = AC = $13cm^2$

Const: Draw altitude from A to BC ($AL \perp BC$).

Now, AL = 5 cm



In ΔALB,

$\angle ALB = 90^0$

$\therefore AB^2 = AL^2 + BL^2$

(by pythagoras theorem)

$\therefore 13^2 = (5)^2 + BL^2$

$(169 - 25)cm^2 = BL^2$

$BL^2 = 144\ cm^2$

$BL = \sqrt{144}cm = 12cm$

In ΔALC,

$AC^2 = AL^2 + LC^2$

$\Rightarrow LC^2 = \left(AC^2 - AL^2\right)$

$= \left[(13)^2 - (5)^2\right]cm^2$

$= (169 - 25)cm^2$

$= 144\ cm^2$

$= \sqrt{144} = 12\ cm$

$\therefore BC = BL + LC = (12 + 12)cm = 24cm$

*********** END **********