class - VII
subject :- math.
chapter :- properties of Triangles.

Pythagorean Triangle.

In a Right-triangle, the square of the hypotenuse equals the sum of the squares of its remaining two sides.

i.e. $H^2 = P^2 + B^2$

[H = Hypotenuse
P = perpendicular.
B = Base]

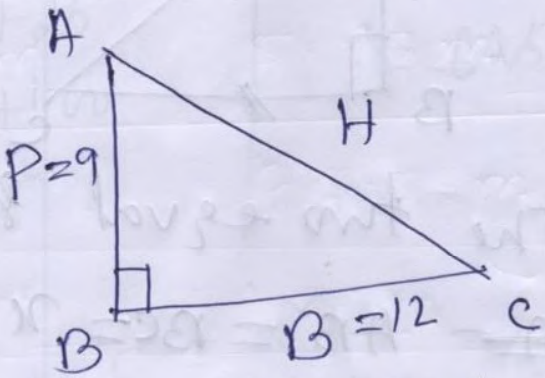
Converse of pythagoras Theorem.

If the square of one side of a triangle is equal to the sum of the squares of the other two sides.

class-VII

Ex=15.2 page :- 193

1.



Right- Triangle.

we know that,

$H^2 = P^2 + B^2$ [By pythagorean theorem]

$\Rightarrow AC^2 = AB^2 + BC^2$

$\Rightarrow AC^2 = 9^2 + 12^2$

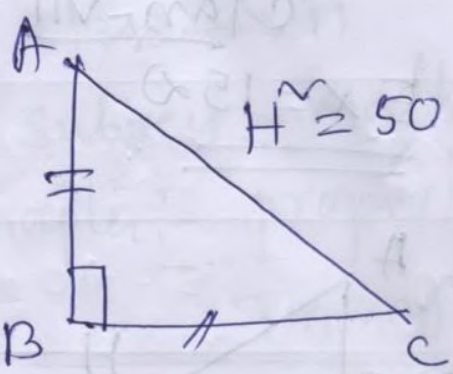
$\Rightarrow AC^2 = 81 + 144$

$\Rightarrow AC^2 = 225$

$\Rightarrow AC = \sqrt{225}$

$\therefore AC = 15$ cm. Ans //

4.



Let, The two equal sides

~~AB~~ AB = BC = x unit.

Given that, $H^2 = 50$

We know that,

$H^2 = P^2 + B^2$ [By pythagoras

$\Rightarrow 50 = x^2 + x^2$

$\Rightarrow 2x^2 = 50$

$\Rightarrow x^2 = 25$

$\Rightarrow x = \sqrt{25}$

$\therefore x = 5$ //

$\therefore AB = BC = 5$

(i) a^2+b^2 | c^2

$= 15^2+20^2$ | $= 25^2$

$= 225+400$ | $= 625$

$= 625.$

$\therefore c^2 = a^2+b^2$

Hence, it is right angle Triangle.

(ii) a^2+b^2 | c^2

$= 9^2+12^2$ | $= 16^2$

$= 81+144$ | $= 256.$

$= 225$

$\therefore a^2+b^2 \neq c^2$

Hence, it is not right-angle Triangle.

(iii) a^2+b^2 | c^2

$= 10^2+24^2$ | $= 26^2$

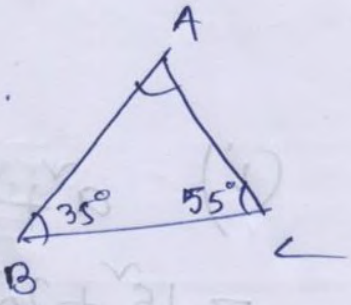
$= 100+576$ | $= 676$

$= 676$

$\therefore a^2+b^2 = c^2$

Hence, it is right angle triangle.

8. Given, $\angle B = 35°$, $\angle C = 55°$.



$\therefore \angle A = 180° - (\angle B + \angle C)$

$= 180° - (35° + 55°)$

$= 180° - 90°$

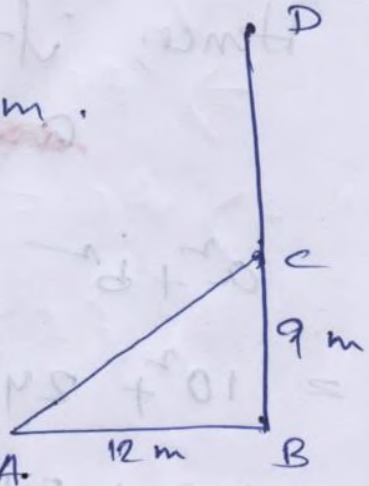
$= 90°$.

$\therefore \triangle ABC$ is a right angle triangle with hypotenuse BC.

$\therefore$ Option (iii) $BC^2 = AB^2 + AC^2$ is correct.

11. Let BD be the height of the tree broken at point C and suppose CD takes the position CA.

Now, $AB = 9$ m, $BC = 12$ m.



By Pythagoras theorem,

$AC^2 = AB^2 + BC^2$

$\Rightarrow AC^2 = 12^2 + 9^2$

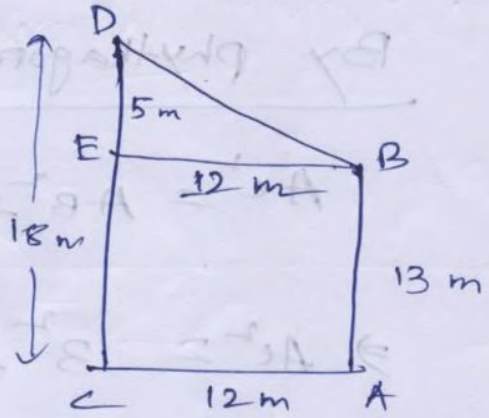
$\Rightarrow AC^2 = 144 + 81$

$\Rightarrow AC^2 = 225$

$\therefore AC = 15$ m.

∴ Length of the tree before it broke
= AC + AB
= (15 + 9) m
= 24 m Ans.

12. Let, AB and CD are the height of the two poles and they are at a distance of 12 m.



Here, Draw BE ⊥ CD.

∴ From right triangle BED,

$BD^2 = DE^2 + BE^2$

$\Rightarrow BD^2 = 5^2 + 12^2$

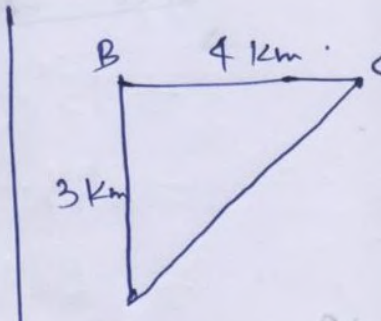
$\Rightarrow BD^2 = 25 + 144$

$\Rightarrow BD^2 = 169$

$\Rightarrow BD = 13$

∴ Distance between their tops is 13 m. Ans.

14. Suppose a man starts from A and then goes 3 km to North and then 4 km to East at C.



Here, $AB = 3$ km.

$BC = 4$ km.

By phythagoras theorem

$$AC^2 = AB^2 + BC^2$$

$$\Rightarrow AC^2 = 3^2 + 4^2$$

$$\Rightarrow AC^2 = 9 + 16$$

$$\Rightarrow AC^2 = 25 \quad \therefore AC = 5$$

Hence, he is 5 km from the initial position.

H/W : Ex-15D (1 to 18) All.

Take care of your study regularly and also health.