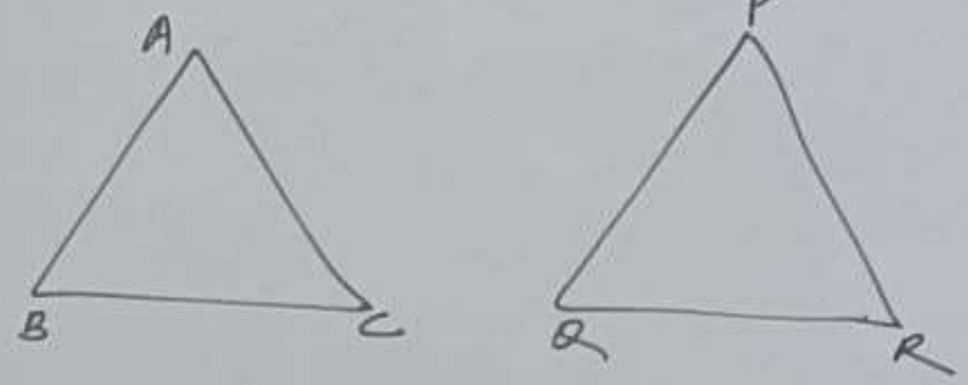
Q. The Perimeter of two Similar triangles are 30 cm and 20 cms. respectively. If Side of the first triangle is 9 cm long, find the length of the second triangle.



Sol.

If $\triangle ABC \sim \triangle PQR$ then,

$$\frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR} = \frac{AB+BC+AC}{PQ+QR+RP} = \frac{P_1}{P_2}$$

$$\frac{AB}{PQ} = \frac{P_1}{P_2}$$

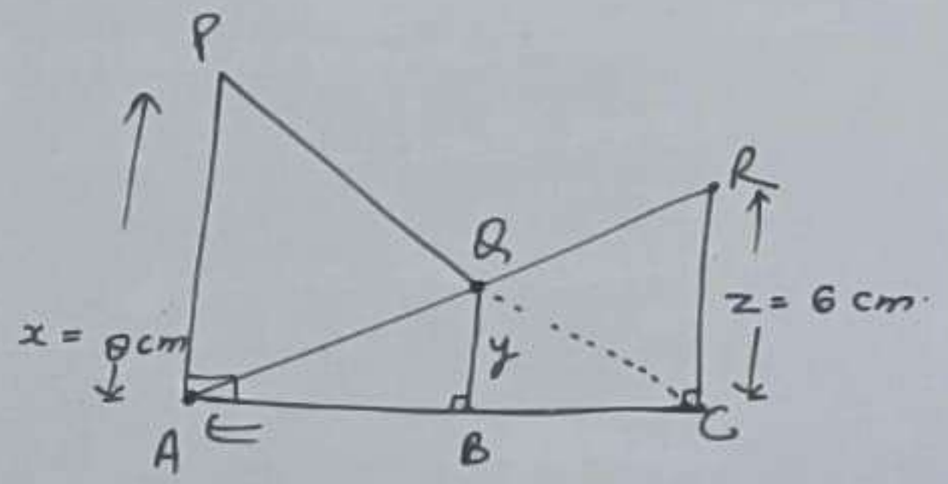
$$\frac{9}{PQ} = \frac{3\cancel{\phi}}{2\cancel{\phi}} \Rightarrow \cancel{3}PQ = 2\times\cancel{9}3$$

$$PQ = 6 \text{ cm.}$$

Ans.

CLASS-X (Topic :- Triangles)

Q:- In fig. PA, QB and RC are each perpendicular to AC. If $x = 8$ cm and $z = 6$ cm, then find the value of y.



Sol: Construction :- Join QC

In $\triangle PAC$

$QB \parallel PA$

$$\frac{QB}{PA} = \frac{AB}{AC} \quad -(i)$$

Now in $\triangle ARC$, $QB \parallel RC$

$$\frac{QB}{RC} = \frac{BC}{AC} \quad -(ii)$$

from eqn (i) & (ii).

$$\frac{QB}{PA} + \frac{QB}{RC} = \frac{AB}{AC} + \frac{BC}{AC}$$

$$\frac{y}{x} + \frac{y}{z} = \frac{AB+BC}{AC}$$

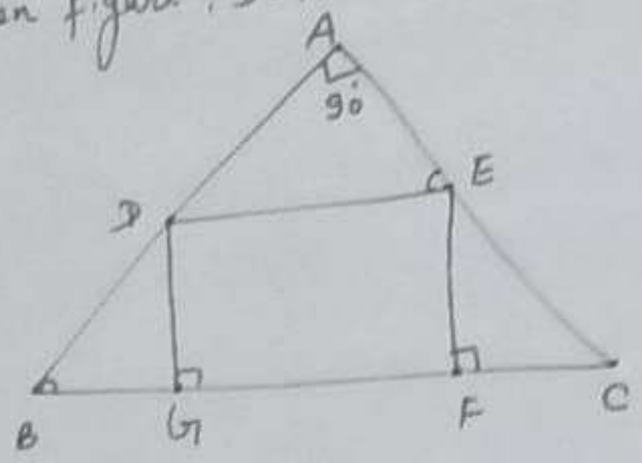
$$y\left(\frac{1}{x}+\frac{1}{z}\right) = \frac{AC}{AC}$$

$$\frac{1}{x}+\frac{1}{z} = \frac{1}{y} \Rightarrow \frac{1}{y} = \frac{1}{8}+\frac{1}{6}$$

$$\frac{1}{y} = \frac{3+4}{24} \quad \therefore \frac{7}{24}$$

$$y = \frac{24}{7} \text{ cm.}$$

Q.2 In the given figure, DEFG is a square and $\angle BAC = 90°$. Show that $FG^2 = BG \times FC$



Sol: Since DEFG is a square, then $DE = EF = GF = DG$

Now in $\triangle ADE$ and $\triangle GBD \Rightarrow \angle DGB = \angle A = 90°$

and $\angle GBD = \angle AED$ ... corresponding angle

So $\triangle ADE \sim \triangle GBD$ — (i) by AA Similarity

Similarly $\triangle AED \sim \triangle EFC$ — (ii) by " "

From eqn (i) & (ii) $\triangle GBD \sim \triangle EFC$

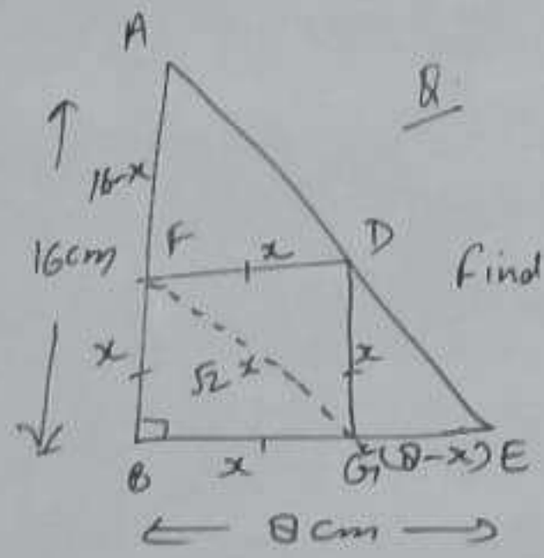
$$\frac{DG}{BG} = \frac{FC}{EF} \Rightarrow DG \times EF = BG \times FC$$

$$FG \times FG = BG \times FC \quad \{\because FG = DG = EF = DE\}$$

$$\boxed{FG^2 = BG \times FC}$$

Hence Proved

CLASS-X (Topic :- Triangles)



Q Sides AB and BE of a right triangle, right angled at B are of lengths 16 cm and 8 cm respectively. Find the length of the side of a square FDGB that can be inscribed in the triangle ABE.

Sol:- Let the side of a square FDGB be x cm, then

FG ∥ AE

$\frac{AF}{AB} = \frac{BG}{BE}$ By BPT

$\frac{16-x}{16} = \frac{x}{8}$

$16-x = 2x$

$16 = 2x+x$

$16 = 3x \Rightarrow x = \frac{16}{3}$ cm.

$FG = \sqrt{x^2+x^2}$

$FG = \sqrt{2}\,x$ cm.