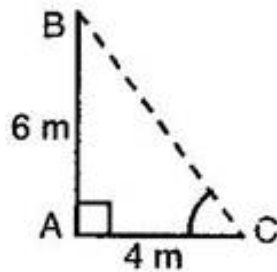15. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

Ans. Let AB the vertical pole and AC be its shadow. Also, let DE be the vertical tower and DF be its shadow. Joined BC and EF.
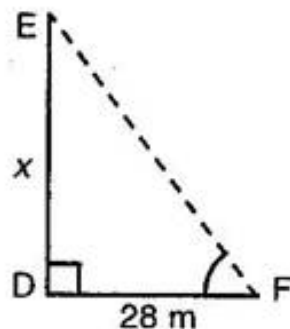

Let DE = x meters

Here, AB = 6 m, AC = 4 m and DF = 28 m

In the triangles ABC and DEF,

$\angle A = \angle D = 90°$

And $\angle C = \angle F$ [Each is the angular elevation of the sun]

∴ By AA-similarity criterion,

$\triangle ABC \sim \triangle DEF$

$$\Rightarrow \frac{AB}{DE} = \frac{AC}{DF}$$

$$\Rightarrow \frac{6}{x} = \frac{4}{28}$$
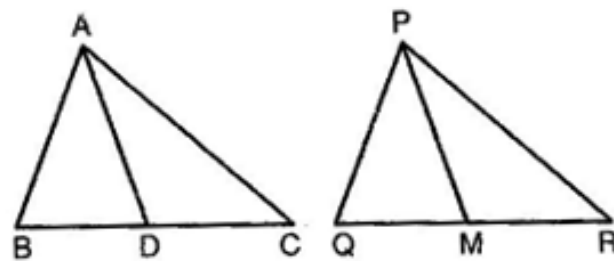
$$\Rightarrow \frac{6}{x} = \frac{1}{7}$$

$$\Rightarrow x = 42 \text{ m}$$

Hence, the height of the tower is 42 meters.

16. If AD and PM are medians of triangles ABC and PQR respectively, where $\triangle ABC \sim \triangle PQR$, prove that $\dfrac{AB}{PQ} = \dfrac{AD}{PM}$. J

Ans. Given: AD and PM are the medians of triangles

ABC and PQR respectively, where

$\triangle ABC \sim \triangle PQR$

To prove: $\dfrac{AB}{PQ} = \dfrac{AD}{PM}$

Proof: In triangles ABD and PQM,

$\angle B = \angle Q$ [Given]

And $\dfrac{AB}{PQ} = \dfrac{\frac{1}{2}BC}{\frac{1}{2}QR}$ [∵ AD and PM are the medians

of BC and QR respectively]

$$\Rightarrow \frac{AB}{PQ} = \frac{BD}{QM}$$

∴ By SAS-criterion of similarity,

Δ ABD ~ Δ PQM

$$\Rightarrow \frac{AB}{PQ} = \frac{BD}{QM} = \frac{AD}{PM}$$

$$\Rightarrow \frac{AB}{PQ} = \frac{AD}{PM}$$

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