

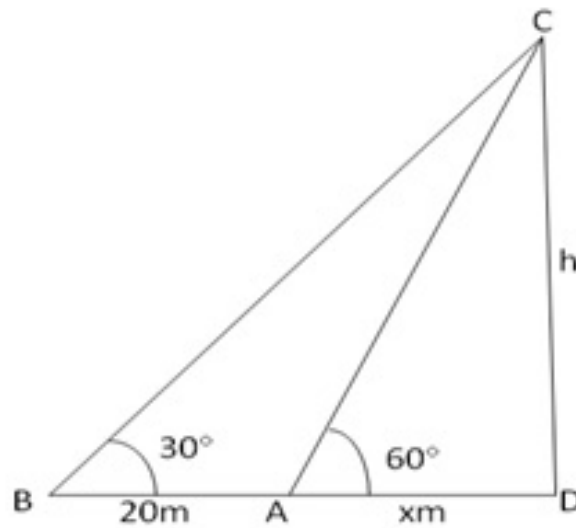


Question 7:

Let CD be the tower and BD be the ground

Then,  $\angle CBD = 30^\circ$ ,  $\angle CAD = 60^\circ$

$\angle BDC = 90^\circ$ ,  $AB = 20$  m,  $CD = h$  metre and  $AD = x$  metre



From  $\triangle BCD$

$$\frac{CD}{BD} = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

$$\frac{h}{20+x} = \frac{1}{\sqrt{3}} \Rightarrow \sqrt{3}h = 20+x$$

$$\Rightarrow \sqrt{3}h = 20+x \Rightarrow x = \sqrt{3}h - 20 \text{ --- (1)}$$

From right  $\triangle CAD$ , we have

$$\frac{CD}{AD} = \tan 60^\circ$$

$$\Rightarrow \frac{h}{x} = \sqrt{3}$$

$$\Rightarrow h = \sqrt{3}x$$

$$\Rightarrow \frac{h}{\sqrt{3}} = x \text{----- (2)}$$

from (1) & (2) we get

$$\sqrt{3}h - 20 = \frac{h}{\sqrt{3}}$$

$$\Rightarrow 3h - 20\sqrt{3} = h$$

$$\Rightarrow h = 10\sqrt{3} = 10 \times 1.732 = 17.32$$

$$BD = (20 + x) \text{ m} = \left( 20 + \frac{h}{\sqrt{3}} \right) \text{ m} = 30 \text{ m}$$

$$\therefore h = 17.32 \text{ m and } BD = 30 \text{ m}$$

Hence, the height of the tower = 17.32m and the distance of the tower from the point A = 30m.

Question 8:

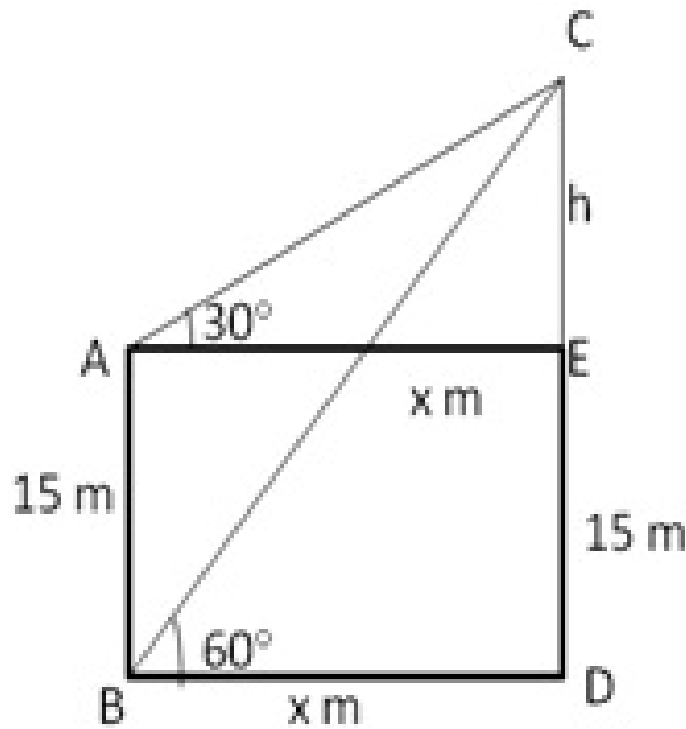
Let AB and CD be the building and the tower respectively.

AB = 15 m, AE  $\perp$  CD

ED = AB = 15 m

Let EC = h m

And BD = AE = x m



In CAE,  
 $\angle CAE = 30^\circ$  and  $\angle AEC = 90^\circ$

$$\frac{CE}{AE} = \tan 30^\circ$$

$$\Rightarrow \frac{h}{x} = \frac{1}{\sqrt{3}}$$

$$\therefore \sqrt{3}h = x \dots (1)$$

In CBD,  $\angle CBD = 60^\circ$  and  $\angle CDB = 90^\circ$

$$\therefore \frac{CD}{BD} = \tan 60^\circ \Rightarrow \frac{h + 15}{x} = \sqrt{3}$$

$$\text{or } h + 15 = \sqrt{3}x \dots (2)$$

Eliminating x from (1) and (2), we get

$$h + 15 = \sqrt{3}(\sqrt{3}h) = 3h$$

$$\Rightarrow 2h = 15 \text{ or } h = 7.5$$

$$\text{From (1), } x = \sqrt{3}h = \sqrt{3} \times 7.5 = 12.99 \text{ m}$$

Height of tower = CE + ED = (h + 15) m

= (7.5 + 15) m = 22.5 m

Hence, Height of the tower = 22.5 m and the distance between the tower and the building = 12.99 m

\*\*\*\*\* END \*\*\*\*\*