

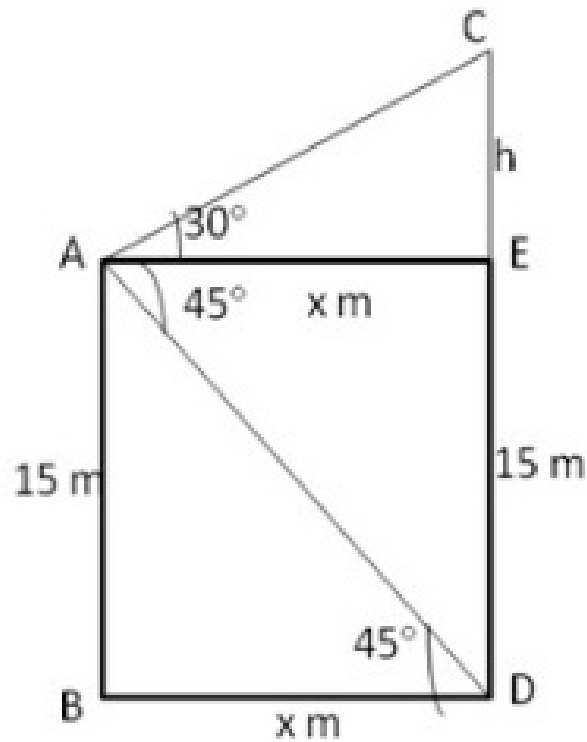


Question 9:

AB and CD are the two houses.

Window is at A.

In $\triangle ABD$, $\angle B = 90^\circ$, $AB = 15\text{m}$



$$\frac{BD}{AB} = \cot 45^\circ = 1$$

$$\therefore BD = AB = 15\text{m}$$

AE is drawn perpendicular to CD

Therefore, $AE = BD = 15\text{m}$

Let $CE = h\text{m}$

In $\triangle ACE$,

$\angle CAE = 30^\circ$, $\angle CEA = 90^\circ$

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

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

$$\therefore \sqrt{3}h = x = 15$$

$$\therefore h = \frac{15}{\sqrt{3}} = \frac{15\sqrt{3}}{3} = 5\sqrt{3} = 5 \times 1.732 = 8.66$$

Height of opposite house = $CE + ED$

$= (h + 15)\text{m} = (8.66 + 15)\text{m} = 23.66\text{m}$

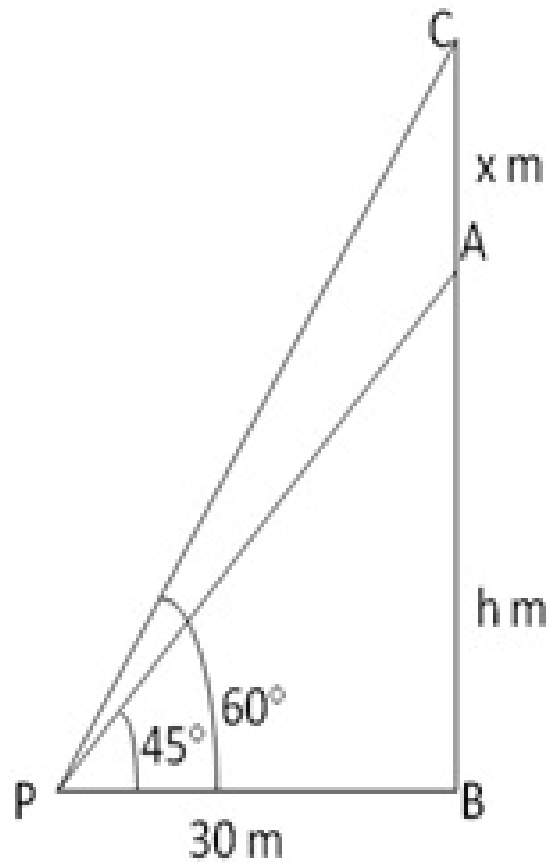
Hence proved.

Question 10:

Let AB be the tower with height = h m

AC = flag staff = x m

PB = 30 m



In ΔPBC ,
 $\angle CPB = 60^\circ$ and $\angle CBP = 90^\circ$

$$\frac{BC}{PB} = \tan 60^\circ$$

$$\frac{x+h}{30} = \sqrt{3}$$

$$\therefore x+h = 30\sqrt{3} \text{ ---- (1)}$$

In ΔAPB ,

$\angle APB = 45^\circ$, $\angle ABP = 90^\circ$

$$\frac{AB}{PB} = \tan 45^\circ$$

$$\frac{h}{30} = 1$$

$$\therefore h = 30 \text{ ---- (2)}$$

Putting value of h in (1), we get

$$x + 30 = 30\sqrt{3}$$

$$\therefore x = 30\sqrt{3} - 30 = 30(\sqrt{3} - 1) = 21.96$$

Thus, height of tower = 30m and height of flag staff = 21.96 m

***** END *****