

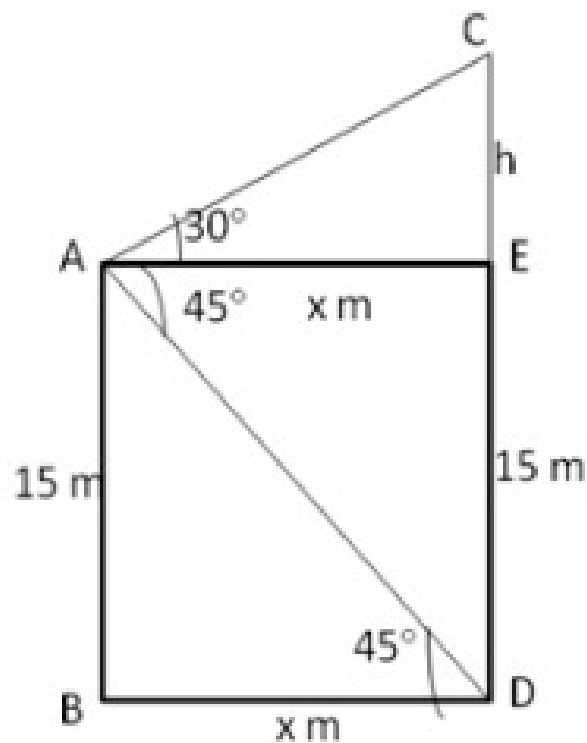


Question 9:

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 =  $CE + ED$

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

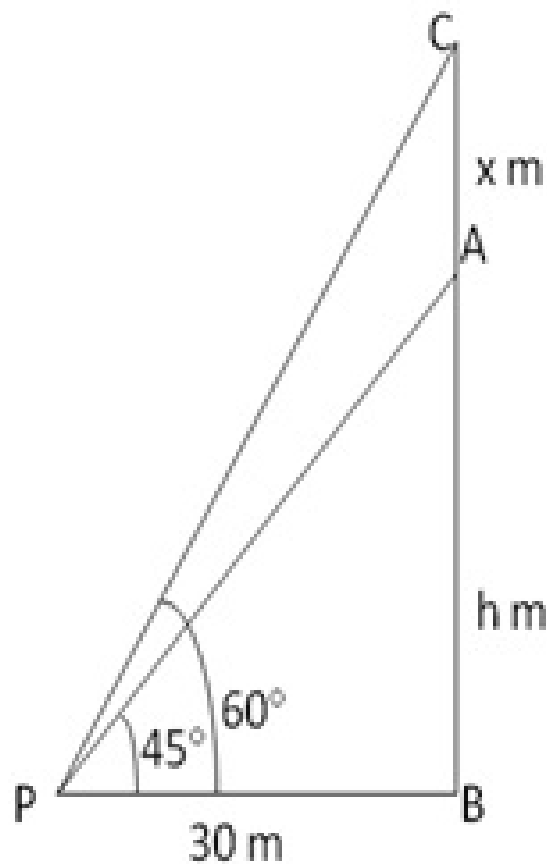
Hence proved.

Question 10:

Let AB be the tower with height = h m

AC = flag staff = x m

PB = 30 m



In  $\Delta PBC$ ,  
 $\angle CPB = 60^\circ$  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  $\Delta APB$ ,

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

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

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

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

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 \*\*\*\*\*