



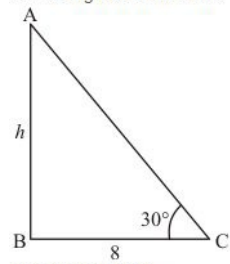
### Some Applications of Trigonometry Ex 12.1 Q19

**Answer :**

Let  $AB$  be the tree of height  $h$ . And the top of tree makes an angle  $30^\circ$  with ground. The distance between foot of tree to the point where the top touches is 8m. Let  $BC = 8$ . And  $\angle ACB = 30^\circ$ .

Here we have to find height of tree.

So we trigonometric ratios



In a triangle  $ABC$ ,

$$\Rightarrow \tan C = \frac{AB}{BC}$$

$$\Rightarrow \tan 30^\circ = \frac{AB}{BC}$$

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{h}{8}$$

$$\Rightarrow h = \frac{8}{\sqrt{3}}$$

Now in triangle  $ABC$

$$\sin 30^\circ = \frac{AB}{AC}$$

$$\Rightarrow \frac{1}{2} = \frac{h}{AC}$$

$$\Rightarrow \frac{1}{2} = \frac{\frac{8}{\sqrt{3}}}{AC}$$

$$\Rightarrow AC = \frac{16}{\sqrt{3}}$$

So the height of the tree is  $h + AC$

$$\begin{aligned} h + AC &= \frac{8}{\sqrt{3}} + \frac{16}{\sqrt{3}} \\ &= 8\sqrt{3} \end{aligned}$$

Hence the height of tree is  $\boxed{8\sqrt{3}}$  m.

Some Applications of Trigonometry Ex 12.1 Q20

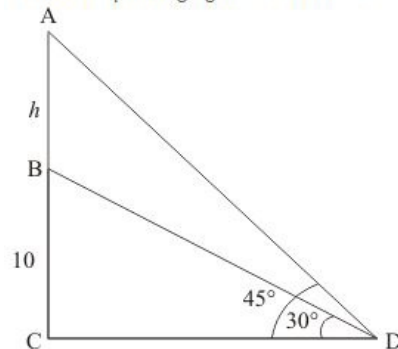
**Answer :**

Let  $AB$  be the flag of length  $h$  m on the building  $BC$ .

We assume that  $BC = 10$ ,  $CP = y$  and  $\angle APC = 45^\circ$ ,  $\angle BPC = 30^\circ$

Now we have to find height of flag-staff and distance of the point  $P$  from the building

The corresponding figure is as follows



In a triangle  $BPC$ ,

$$\Rightarrow \tan P = \frac{BC}{CP}$$

$$\Rightarrow \tan 30^\circ = \frac{BC}{CP}$$

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{10}{y}$$

$$\Rightarrow y = 10\sqrt{3}$$

$$\Rightarrow y = 17.32$$

Again in a triangle  $ACP$ ,

$$\Rightarrow \tan P = \frac{AB + BC}{CP}$$

$$\Rightarrow \tan 45^\circ = \frac{h + 10}{y}$$

$$\Rightarrow 1 = \frac{h + 10}{17.32}$$

$$\Rightarrow h = 10 - 17.32$$

$$\Rightarrow h = 7.32$$

Hence the length is  $\boxed{17.32}$  m and distance is  $\boxed{7.32}$  m.

Some Applications of Trigonometry Ex 12.1 Q21

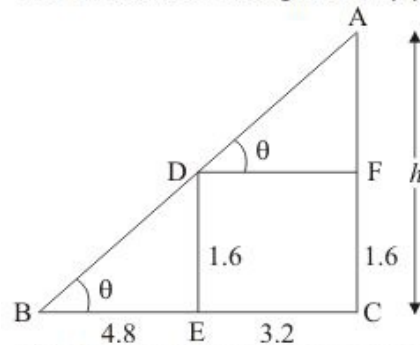
**Answer :**

Let  $AC$  be the lamp post of height  $h$ .

We assume that  $ED = 1.6$  m,  $BE = 4.8$  m and  $EC = 3.2$  m

We have to find the height of the lamp post

Now we have to find height of lamp post using similar triangles.



Since triangle  $BDE$  and triangle  $ABC$  are similar.

$$\frac{AC}{BC} = \frac{ED}{BE}$$

$$\frac{h}{4.8 + 3.2} = \frac{1.6}{4.8}$$

$$h = \frac{8}{3}$$

Again, we have to find height of lamp post using trigonometric ratios.

In  $\triangle ADE$

$$\Rightarrow \tan \theta = \frac{1.6}{4.8}$$

$$\Rightarrow \tan \theta = \frac{1}{3}$$

Again in  $\triangle ABC$

$$\Rightarrow \tan \theta = \frac{h}{4.8 + 3.2}$$

$$\Rightarrow \frac{1}{3} = \frac{h}{8}$$

$$\Rightarrow h = \frac{8}{3}$$

Hence the height of lamp post is  $\boxed{\frac{8}{3}}$  m.

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