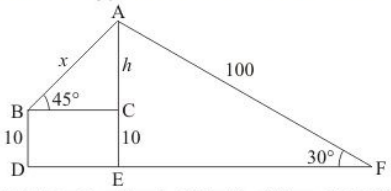
Some Applications of Trigonometry Ex 12.1 Q58

Answer :

Let AB be the string of string x m. let DF be the ground and a boy flying kite of 100 m string at an elevation of 30° .And another boy flying kite of 10 m high building at an angle of elevation 45° .



Let $AE = H$, $AC = h$, $CE = 10$, $AB = x$, and $AF = 100$ m. $\angle ABC = 45^\circ$, $\angle AFE = 30^\circ$

Here we have to find length of string.

We use trigonometric ratios.

In ΔAFE,

$$\Rightarrow \sin 30^\circ = \frac{AE}{AF}$$

$$\Rightarrow \frac{1}{2} = \frac{H}{100}$$

$$\Rightarrow H = 50$$

$$\Rightarrow h = H - 10$$

$$\Rightarrow h = 50 - 10$$

$$\Rightarrow h = 40$$

Again in ΔABC,

$$\Rightarrow \sin 45^\circ = \frac{AB}{AC}$$

$$\Rightarrow \frac{1}{\sqrt{2}} = \frac{h}{x}$$

$$\Rightarrow \frac{1}{\sqrt{2}} = \frac{40}{x}$$

$$\Rightarrow x = 40\sqrt{2}$$

Hence the length of string is $\boxed{40\sqrt{2}}$.

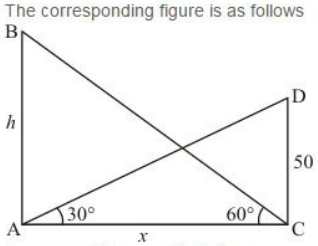
Some Applications of Trigonometry Ex 12.1 Q59

Answer :

Let h be the height of hill AB. And CD be the tower of height 50 m. Angle of elevation of the top of hill from the foot of tower is 60° and angle of elevation of top of tower from foot of hill is 30°. Let $AB = h$ and $\angle DAC = 30°$, $\angle ACB = 60°$

Here we have to find height of hill.

The corresponding figure is as follows



So we use trigonometric ratios.

In ΔACD,

$$\Rightarrow \quad \tan 30° = \frac{CD}{AC}$$

$$\Rightarrow \quad \frac{1}{\sqrt{3}} = \frac{50}{x}$$

$$\Rightarrow \quad x = 50\sqrt{3}$$

Again in ΔABC

$$\Rightarrow \quad \tan 60° = \frac{AB}{AC}$$

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

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

$$\Rightarrow \quad h = 150$$

Hence the height of hill is $\boxed{150}$ m.

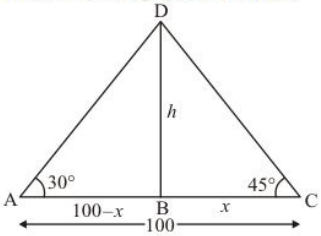
Some Applications of Trigonometry Ex 12.1 Q60

Answer :

Let h be the height of light house BD. Angle of elevation of the top of light house from two boats are 30° and 45°. Let $DB = h$, $BC = x$ and it is given that $AC = 100$ m. So $AB = 100 - x$. And $\angle DAB = 30°$, $\angle BCD = 45°$

Here we have to find height of light house.

The corresponding figure is as follows



So we use trigonometric ratios.

In ΔBDC,

$$\Rightarrow \quad \tan 45° = \frac{BD}{BC}$$

$$\Rightarrow \quad 1 = \frac{h}{x}$$

$$\Rightarrow \quad x = h$$

Again in ΔDAB

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

$$\Rightarrow \quad \frac{1}{\sqrt{3}} = \frac{h}{100-x}$$

$$\Rightarrow \quad \sqrt{3}h = 100 - x$$

$$\Rightarrow \quad \sqrt{3}h = 100 - h$$

$$\Rightarrow \quad \left(\sqrt{3}+1\right)h = 100$$

$$\Rightarrow \quad h = \frac{100}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}-1}$$

$$\Rightarrow \quad h = 50\left(\sqrt{3}-1\right)$$

Hence the height of light house is $\boxed{50\left(\sqrt{3}-1\right)}$ m.

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