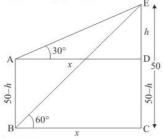


Some Applications of Trigonometry Ex 12.1 Q43 Answer:

Let $\it AB$ and $\it CE$ are two temples each at the bank of river. The top of the temple $\it CE$ makes angle of depressions at the top and bottom of tower $\it AB$ are 30° and 60°

Let CE = 50 m and AB = H m and $\angle CBE = 60^{\circ}$, $\angle DAE = 30^{\circ}$

The corresponding figure is as follows



 $\ln \Delta ADE$.

$$\Rightarrow$$
 $\tan 30^\circ = \frac{h}{2}$

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

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

Again in $\triangle BCE$,

$$\Rightarrow \tan 60^{\circ} = \frac{50}{x}$$

$$\Rightarrow$$
 $\sqrt{3} = \frac{50}{3}$

$$\Rightarrow \qquad 50 = \sqrt{3} \times h\sqrt{3}$$

$$\Rightarrow h = \frac{50}{3}$$

Now the distance between the temples

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

$$=\frac{50}{3}\times\sqrt{3}$$

$$=\frac{50}{\sqrt{3}}$$

Therefore $H = 50 - \frac{50}{3}$

$$\Rightarrow$$
 $H = 33.33$

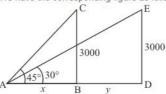
Hence distance between the temples is $\boxed{\frac{50}{\sqrt{3}} \text{ m} = 28.83 \text{ m}}$ m and height of temple is $\boxed{33.33}$ m.

Some Applications of Trigonometry Ex 12.1 Q44

Answer:

Let angle of elevation of an aero plane is 45°. After 15 second angle of elevation is change to 30°. Let DE be the height of aero plane which is 3000 meter above the ground. Let AB = x, BD = y, $\angle CAB = 45^\circ$ and $\angle EAD = 30^\circ$. Here we have to find speed of aero plane.

We have the corresponding figure as follows



So we use trigonometric ratios.

In ΔABC

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

$$\Rightarrow \tan 45^\circ = \frac{3000}{x}$$

$$\Rightarrow 1 = \frac{3000}{x}$$

$$\Rightarrow x = 3000$$

Again in $\triangle ADE$

$$\Rightarrow \tan A = \frac{DE}{AB + BD}$$

$$\Rightarrow \tan 30^{\circ} = \frac{3000}{x + y}$$

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{3000}{3000 + y}$$

$$\Rightarrow 3000 + y = 3000\sqrt{3}$$

$$\Rightarrow y = 3000(\sqrt{3} - 3000)$$

$$\Rightarrow y = 3000(\sqrt{3} - 1)$$

$$\Rightarrow y = 2196$$
Since $15 \sec = 2196$

$$\Rightarrow \sec = \frac{2196}{15} = 146.4$$

$$= \frac{146.4 \times 3600}{1000}$$

$$= 527.04$$

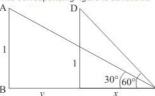
Hence the speed of aero plane is 527.04 km/h.

Some Applications of Trigonometry Ex 12.1 Q45

Answer:

An aero plane is flying 1 km above the ground making an angle of elevation of aero plane 60°. After 10 seconds angle of elevation is changed to 30°. Let CE=x, BC=y, $\angle AEB=30^{\circ}$, $\angle DEC=60^{\circ}$, AB=1 km and CD=1 km. Here we have to find speed of aero plane.

The corresponding figure is as follows



So we use trigonometric ratios.

In ΔDCE

$$\Rightarrow \tan 60^\circ = \frac{1}{x}$$

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

Again in $\triangle ABE$,

$$\Rightarrow \tan 30^\circ = \frac{1}{x+y}$$

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

$$\Rightarrow$$
 $x + y = \sqrt{3}$

$$\Rightarrow \qquad y = \sqrt{3} - \frac{1}{\sqrt{3}}$$

$$\Rightarrow y = \frac{2}{\sqrt{3}}$$

$$speed = \frac{distance}{time}$$

$$=\frac{y}{10\sec}$$

$$= \frac{\frac{2}{\sqrt{3}}}{\frac{10}{60 \times 60}}$$
$$= 415.68$$

Hence the speed of aero plane is 415.68 km/h.

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