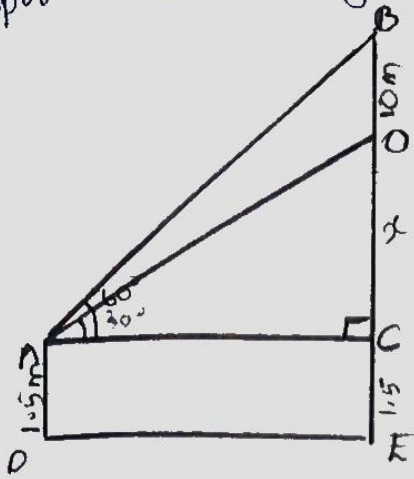


A 1.5 m tall boy saw the top of building under construction at an elevation of  $30^\circ$ . The completed building was 10 m higher and the boy saw its top at elevation of  $60^\circ$  from the same spot. What is height of building?



In  $\triangle ABC$ ,

$$\tan 60 = \frac{x+10}{AC}$$

$$\sqrt{3} = \frac{x+10}{AC}$$

$$AC = \frac{x+10}{\sqrt{3}} \quad \text{--- (2)}$$

$$AC = \frac{x+10}{\sqrt{3}} = \sqrt{3} x$$

$$3x = x+10$$

$$3x - x = 10$$

$$2x = 10$$

$$x = 5$$

$$BC = 10 + 5$$

$$= \underline{\underline{15 \text{ m}}}$$

$$\begin{aligned} \text{height of building} &= 5 + 1.5 + 10 \\ &= \underline{\underline{16.5 \text{ m}}} \end{aligned}$$

$$\begin{aligned} \text{Height of building} &= \\ &= x + 1.5 + 10 \\ &= 11.5 + x \end{aligned}$$

In  $\triangle AOC$ ,

$$\tan 30^\circ = \frac{x}{AC}$$

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

$$AC = \sqrt{3} x \quad \text{--- (1)}$$