MATHEMATICS

Assignment

1) A 1·5 metre tall boy saw the top of a building under construction at an elevation of 30°. The completed building was 10 metres higher and the boy saw its top at an elevation of 60° from the same spot. What is the height of the building ?

Ans)

AC = boy, DQ = building

In $\triangle ABP$, let PB = x

$\tan 30 = \dfrac{x}{AB}$, $\dfrac{1}{\sqrt{3}} = \dfrac{x}{AB}$

$AB = \sqrt{3}\, x \longrightarrow ①$

In $\triangle ABQ$, $\tan 60 = \dfrac{x+10}{AB}$

$\sqrt{3} = \dfrac{x+10}{AB}$, $\sqrt{3}\,AB = x+10$

$AB = \dfrac{x+10}{\sqrt{3}} \longrightarrow ②$

From ① and ②

$$\sqrt{3}\,x = \dfrac{x+10}{\sqrt{3}}$$

$3x = x+10$ (multiplied by $\sqrt{3}$)

$3x - x = 10$, $2x = 10$

$\therefore x = \dfrac{10}{2} = \underline{\underline{5}}$

BQ = 5 +10

= 15 m

$\therefore$ Heigth of the building

= 15 + 1·5

= 16·5 m