MATHEMATICS

Assignment

1) 1.5 m tall Manu is standing at the edge of a river sees the top of the tree on the opposite edge at an elevation 30°. stepping back 50 m, he sees its top at an elevation 15°. Find the height of the tree and width of the river.
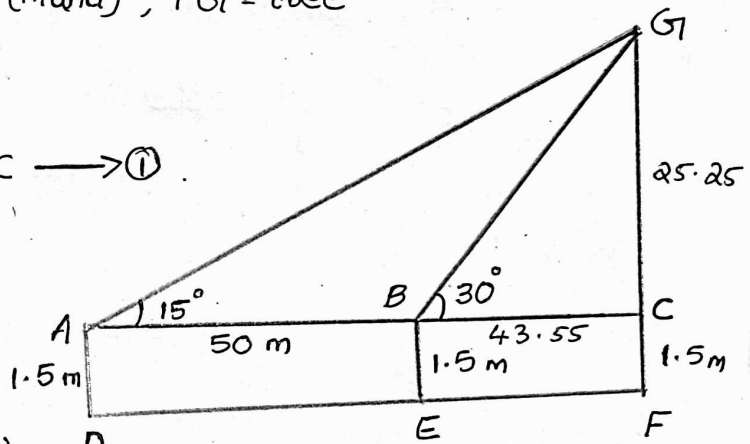
Ans)

EF = river , AD = boy (manu) , FG = tree

$\tan 30 = \dfrac{GC}{BC}$

$GC = 0.5774 \times BC \longrightarrow ①$

$\tan 15 = \dfrac{GC}{AC} = \dfrac{GC}{AB+BC}$

$= \dfrac{GC}{50+BC}$

∴ $GC = 0.2679 \times (50+BC) \longrightarrow ②$

From ① and ②

$0.5774\, BC = 0.27 \times (50 + BC)$

$0.58\, BC = 0.27 \times 50 + 0.27 \times BC$

$0.58\, BC - 0.27\, BC = 13.5$

$0.31\, BC = 13.5$

∴ $BC = \dfrac{13.5}{0.31} = 43.55$

From ①, $GC = 0.58 \times 43.55 = 25.25$

∴ width of the river = 43.55 m

Height of the tree = 25.25 + 1.5
= 26.75 m