



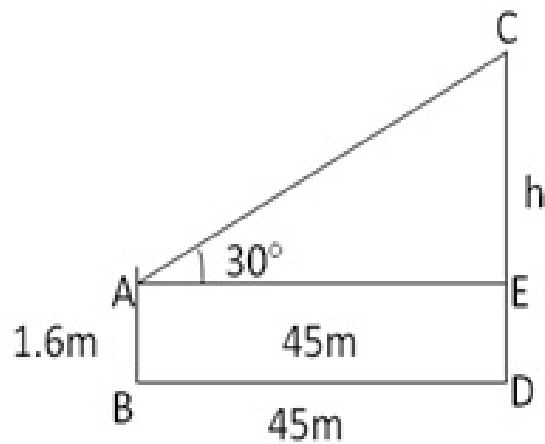
Question 3:

Let AB be the man,

AB = 1.6m, CD is the tower

AE ⊥ CD, DE = AB

Let CE = h



In $\triangle ACE$,

$$\angle AEC = 90^\circ, \angle CAE = 30^\circ$$

$$\frac{CE}{AE} = \tan 30^\circ \Rightarrow \frac{h}{45} = \frac{1}{\sqrt{3}}$$

$$\therefore h = \frac{45}{\sqrt{3}} \text{ m} = \frac{45\sqrt{3}}{3} \text{ m}$$

$$= 15\sqrt{3} \text{ m}$$

$$= 15 \times 1.732$$

$$= 25.98 \text{ m}$$

$$\text{Height of tower} = DE + DC = (1.6 + 25.98) \text{ m} = 27.58 \text{ m}$$

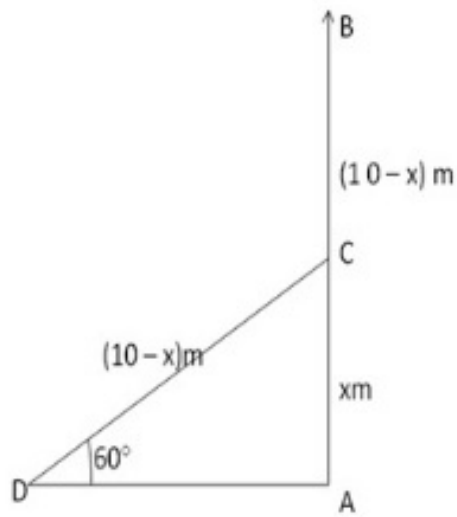
Question 4:

Let AB be the tree bent at the point C so that part CB takes the position CD, then $CD = CB$

Let $AC = x$ meters

Then, $CD = CB = (10 - x) \text{ m}$

and $\angle ADC = 60^\circ$



$$\therefore \frac{AC}{CD} = \sin 60^\circ$$

$$\frac{x}{(10-x)} = \frac{\sqrt{3}}{2}$$

$$\Rightarrow 2x = 10\sqrt{3} - \sqrt{3}x$$

$$\Rightarrow x = \frac{10\sqrt{3}}{(2+\sqrt{3})} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} = (20\sqrt{3} - 30) \text{ m}$$

$$\Rightarrow x = (20 \times 1.732 - 30) \text{ m} = (34.64 - 30) \text{ m} = 4.64 \text{ m}$$

Hence, $AC = 4.64 \text{ m}$

Therefore, tree bent at the height of 4.64m from the bottom.

***** END *****