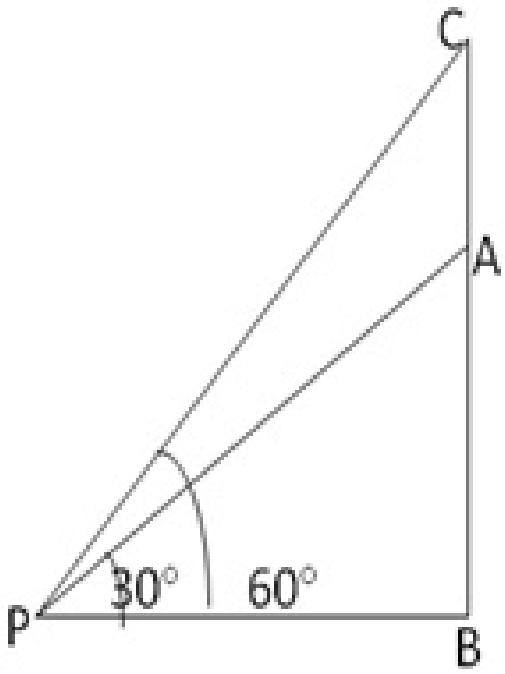
Question 11:
Let AB be the tower h metre high. CA is the flag staff 5 meter high.
Let PB = x meter



In Δ PBC,
∠CPB = 60°, ∠PBC = 90°

$$\frac{BC}{PB} = \tan 60°$$

$$\frac{5+h}{x} = \sqrt{3}$$

$$\therefore\ 5 + h = \sqrt{3}x \text{ ----(1)}$$

In Δ APB,
∠APB = 30° and ∠ABP = 90°

$$\frac{AB}{PB} = \tan 30°$$

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

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

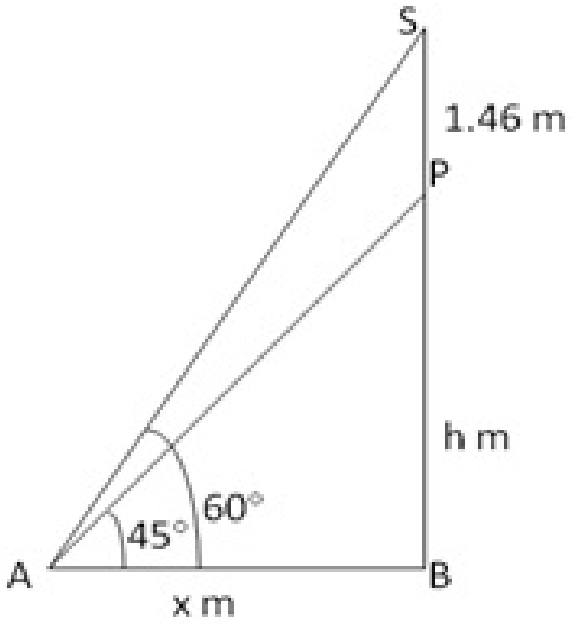
Putting value of x in (1), we get

$$5 + h = \sqrt{3} \times \sqrt{3}h = 3h \quad \therefore 2h = 5$$

$$\text{or } h = \frac{5}{2}\text{m} = 2.5\,\text{m}$$

Thus, height of tower = 2.5m

Question 12:
Let SP be the statue and PB be the pedestal. Angles of elevation of S and P are 60° and 45° respectively.
Further suppose AB = x m, PB = h m



In right Δ ABS,

$$\frac{SB}{AB} = \tan 60° = \sqrt{3}$$

$$\Rightarrow \frac{h + 1.46}{x} = \sqrt{3} \text{ - - - - (1)}$$

In right Δ PAB,

$$\frac{PB}{AB} = \tan 45° = 1$$

$$\therefore h = x \text{ - - - (2)}$$

Putting $x = h$ in (1)

$$\frac{h + 1.46}{h} = \sqrt{3} \Rightarrow h + 1.46 = \sqrt{3}h$$

$$\text{or } h(\sqrt{3} - 1) = 1.46 \quad \therefore h = \frac{1.46}{\sqrt{3} - 1} \times \frac{\sqrt{3} + 1}{\sqrt{3} + 1}$$

$$\therefore \quad h = \frac{1.46}{2} \times (\sqrt{3} + 1) = 0.73 \times 2.732$$

$$= 2\,\text{m (nearly)}$$

Thus, height of the pedestal = 2m

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