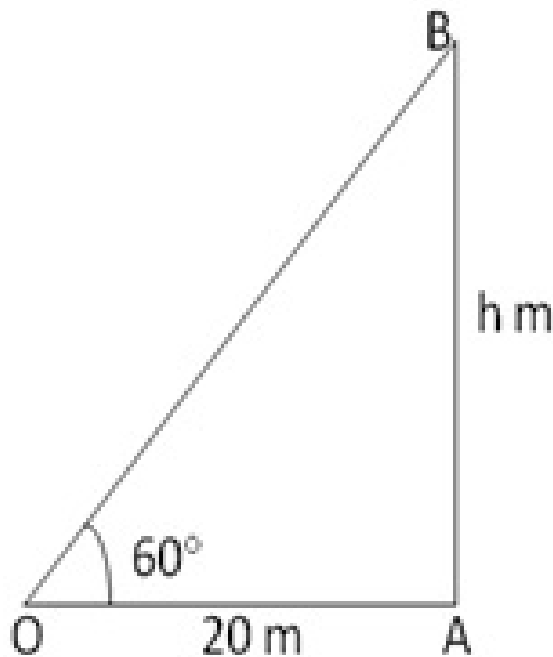




#### Exercise 14

Question 1:

Let AB be the tower standing on a level ground and O be the position of the observer. Then OA = 20 m and  $\angle OAB = 90^\circ$  and  $\angle AOB = 60^\circ$



Let AB = h meters

From the right  $\Delta OAB$ , we have

$$\frac{AB}{OA} = \tan 60^\circ = \sqrt{3}$$

$$\Rightarrow \frac{h}{20} = \sqrt{3}$$

$$\Rightarrow h = (20 \times \sqrt{3})$$

$$\Rightarrow h = 20 \times 1.732$$

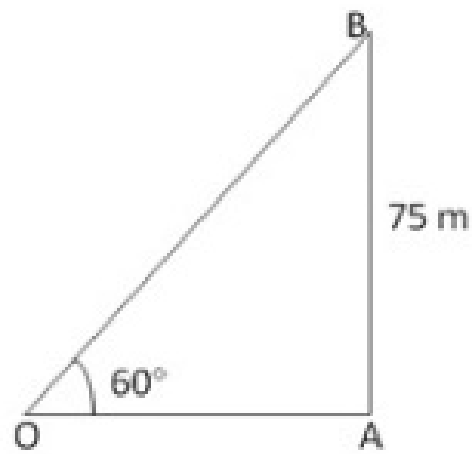
$$\Rightarrow h = 34.64 \text{ m}$$

Hence the height of the tower is  $20\sqrt{3} \text{ m} = 34.64 \text{ m}$

Question 2:

Let OB be the length of the string from the level of ground and O be the point of the observer, then, AB = 75m and  $\angle OAB = 90^\circ$  and  $\angle AOB = 60^\circ$ , let OB = l meters.

From the right  $\Delta OAB$ , we have



$$\frac{OB}{AB} = \sec 60^\circ = \frac{2}{\sqrt{3}}$$

$$\frac{l}{75} = \frac{2}{\sqrt{3}}$$

$$\Rightarrow l = \left( 75 \times \frac{2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} \right)$$

$$\Rightarrow l = 25 \times 2 \times \sqrt{3}$$

$$\Rightarrow l = 50\sqrt{3}\text{m}$$

$$\Rightarrow l = 86.6\text{m}$$

Hence, the length of the string 86.6 m

\*\*\*\*\* END \*\*\*\*\*