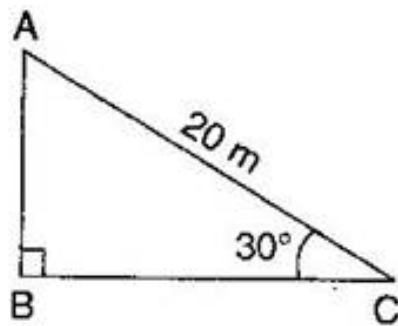




NCERT Solutions For Class 10 Maths Chapter 9 Some Applications of Trigonometry Exercise 9.1

**Q1.** A circus artist is climbing a 20 m long rope, which is tightly stretched and tied from the top of a vertical pole to the ground. Find the height of the pole, if the angle made by the rope with the ground level is  $30^\circ$  (see figure).



**Ans:** In right triangle ABC,

$$\sin 30^\circ = \frac{AB}{AC}$$

$$\Rightarrow \frac{1}{2} = \frac{AB}{20}$$

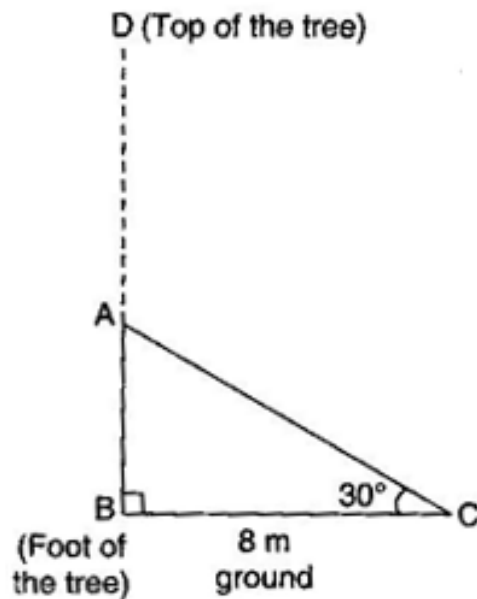
$$\Rightarrow AB = 10 \text{ m}$$

Hence, the height of the pole is 10 m.

**Q2.** A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle  $30^\circ$  with it. The distance between the foot of the tree to the point where the top touches the ground is 8 m. Find the height of the tree.

**Ans:** In right triangle ABC,

$$\cos 30^\circ = \frac{BC}{AC}$$



$$\Rightarrow \frac{\sqrt{3}}{2} = \frac{8}{AC}$$

$$\Rightarrow AC = \frac{16}{\sqrt{3}} \text{ m}$$

$$\text{Again, } \tan 30^\circ = \frac{AB}{BC}$$

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{AB}{8}$$

$$\Rightarrow AB = \frac{8}{\sqrt{3}} \text{ m}$$

$$\therefore \text{Height of the tree} = AB + AC$$

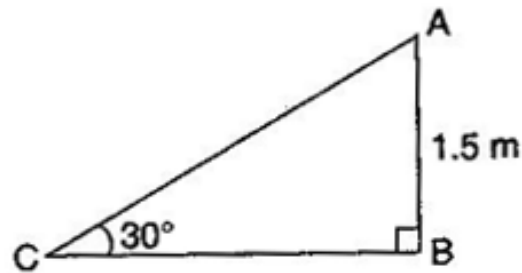
$$= \frac{8}{\sqrt{3}} + \frac{16}{\sqrt{3}} = \frac{24}{\sqrt{3}}$$

$$= \frac{24}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = 8\sqrt{3} \text{ m}$$

**Q3.** A contractor plans to install two slides for the children to play in a park. For the children below the age of 5 years, she prefers to have a slide whose top is at a height of 1.5 m and is inclined at an angle of  $30^\circ$  the ground, whereas for elder children, she wants to have a steep slide at a height of 3 m and inclined at an angle of  $60^\circ$  the ground. What should be the length of the slide in each case?

**Ans:** In right triangle ABC,

$$\sin 30^\circ = \frac{AB}{AC}$$

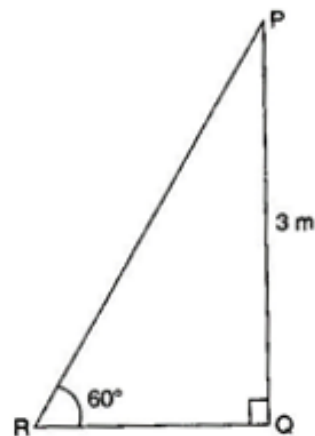


$$\Rightarrow \frac{1}{2} = \frac{1.5}{AC}$$

$$\Rightarrow AC = 3 \text{ m}$$

In right triangle PQR,

$$\sin 60^\circ = \frac{PQ}{PR}$$



$$\Rightarrow \frac{\sqrt{3}}{2} = \frac{3}{PR}$$

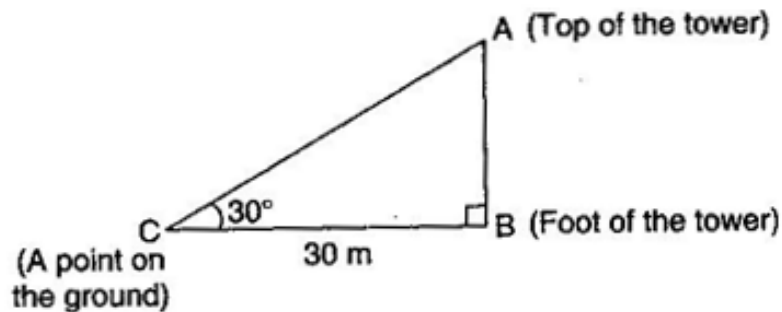
$$\Rightarrow PR = 2\sqrt{3} \text{ m}$$

Hence, the lengths of the slides are 3 m and  $2\sqrt{3}$  m respectively.

**Q4.** The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower is  $30^\circ$ . Find the height of the tower.

**Ans:** In right triangle ABC,

$$\tan 30^\circ = \frac{AB}{BC}$$



$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{AB}{30}$$

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