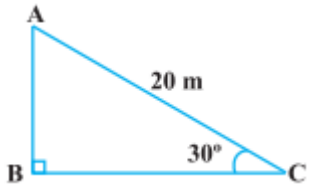
SOME APPLICATIONS OF TRIGONOMETRY

Class 10 - Mathematics

1. 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^o. **[2]**



[2020]

2. 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^o 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. **[2]**

[2011]

3. 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° to 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° to the ground. What should be the length of the slides in each case? **[2]**

4. 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^o. Find the height of the tower. **[2]**

[2023]

5. A kite is flying at a height of 60 m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is 60^o. Find the length of the string, assuming that there is no slack in the string. **[2]**

6. A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Find the distance he walked towards the building. **[2]**

[2014]

7. From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 20 m high building are 45^o and 60^o respectively as shown in Figure. Find the height of the transmission **[5]**

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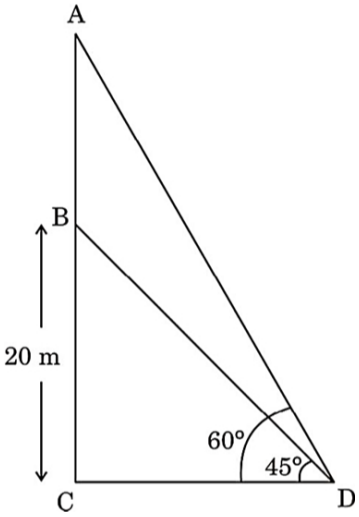
tower.



[2022, 2019, 2017]

8. A statue, 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60^o and from the same point the angle of elevation of the top of the pedestal is 45^o. Find the height of the pedestal. **[5]**

[2020, 2014, 2008]

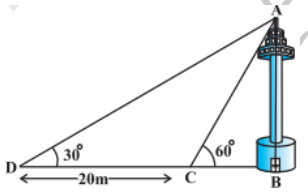
9. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60°. If the tower is 50 m high, find the height of the building. **[5]**

[2022, 2020, 2011, 2009]

10. Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60^o and 30^o respectively. Find the height of the poles and the distances of the point from the poles. **[5]**

[2019, 2018, 2015, 2013, 2012]

11. A TV tower stands vertically on a bank of a canal. From a point on the other bank directly opposite the tower, the angle of elevation of the top of the tower is 60°. From another point 20 m away from this point on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is 30°. Find the height of the tower and the width of the canal. **[5]**



[2024, 2017, 2014]

12. From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60^o and the angle of depression of its foot is 45^o. Determine the height of the tower. **[2]**

[2023, 2022, 2020, 2017, 2014]

13. As observed from the top of a 75 m high lighthouse from the sea-level, the angles of depression of two ships are 30^o and 45^o. If one ship is exactly behind the other on the same side of the lighthouse, find the distance between two ships. **[3]**

[2019, 2014]

14. A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60°. After some time, the angle of **[2]**

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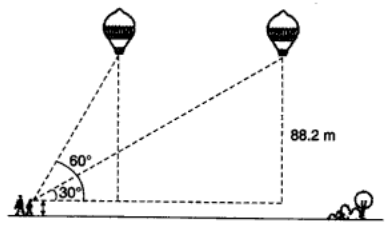
elevation reduces to 30°. Find the distance traveled by the balloon during the interval.



15. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the further time taken by the car to reach the foot of the tower from this point. **[5]**

[2017, 2009, 2008]

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