

INTERNATIONAL INDIAN SCHOOL BURAIDAH

Worksheet for the Academic Year 2024-25

CLASS: X SUBJECT: MATHEMATICS DATE: 20-11-2024

LESSON: 09 SOME APPLICATIONS OF TRIGONOMETRY

1. If the height of the tower is equal to the length of its shadow, then the angle of elevation of the Sun is (Ans: 45°)
2. The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 9.5m away from the wall. Find the length of the ladder (Ans: 19m)
3. From a point on the ground which is 30m away from the foot of a vertical tower, the angle of elevation of the top of the tower is found to be 60° . Find the height of the tower (Ans: $30\sqrt{3}$ m)
4. From a top of a building 15m high the angle of elevation of the top of a tower is found to be 30° . From the bottom of the same building, the angle of elevation of the top of the tower is found to be 60° . Find the height of the tower and the distance between the tower and the building (Ans: 22.5m, 12.975m)
5. The ratio of the length of a vertical rod and the length of its shadow is 1: $\sqrt{3}$. What is the angle of elevation of the Sun at that moment? (Ans: 30°)
6. The shadow of a tower standing on a level ground is found to be 40m longer when Sun's altitude is 30° than when it was 60° . Find the height of the tower. (Ans: $20\sqrt{3}$ m)
7. Find the length of the shadow on the ground on a pole of height 18m when angle of elevation θ of the Sun is such that $\tan\theta = \frac{6}{7}$ (Ans: 21m)
8. The angle of elevation of a jet plane from point A, on the ground is 60° . After a flight of 30s the angle of elevation changes to 30° . If the jet plane is flying at a constant height of $3600\sqrt{3}$ m, Find the speed of the jet plane (Ans: 240m/s)
9. A boy standing on a horizontal plane finds a bird flying at a distance of 100m from him at an elevation of 30° . A girl standing on the roof of a 20m high building finds the elevation of the same bird to be 45° . The boy and the girl are on the opposite side of the bird. Find the distance of the bird from the girl ($\sqrt{2} = 1.414$) (Ans: 42.42m)
10. A boy is 1.7m tall is standing on a horizontal ground, 50m away from the building. The angle of elevation of the top of the building from his eyes is 60° . Calculate the height of the building. (Take $\sqrt{3} = 1.73$) (Ans: 88.2m)
11. A moving boat is observed from the top of a 150m high cliff moving away from the cliff. The angle of depression of the boat changes from 60° to 45° in 2min. Find the speed of the boat (Ans: $1500(3 - \sqrt{3})$ m/h)
12. As observed from the top of a lighthouse of a ship, 100m above sea level, the angle of depression of a ship, sailing directly towards it, changes from 30° to 45° . Determine the distance travelled by ship during the period of observation. (Ans: 73.2m)
13. From a window 15 meters high above the ground in a street, the angles of elevation and depression of the top and the foot of another house on the opposite sides of the

street are 30° and 45° respectively, show that the height of the opposite house is 23.66metres (Take $\sqrt{3} = 1.732$)

14. The angle of elevation of a cloud from a point 60m above a lake is 30° and the angle of depression of the reflection of cloud in the lake is 60° . Find the height of the cloud

(Ans: 120m)

15. The angles of depression of the top and bottom of a building 50 meters high as observed from the top of a tower are 30° and 60° respectively. Find the height of the tower, and also the horizontal distance between the building and the tower

(Ans: 75m, 43.30m)

16. The lower window of a house is at a height of 2m above the ground and its upper window is 4m vertically above the lower window. At certain instant the angles of elevation of a balloon from these windows are observed to be 60° and 30° respectively. Find the height of the balloon above the ground.

(Ans: 8m)
