

1. A vertical tower stands on a horizontal plane and is surmounted by a flagstaff of height 5m. From a point on the ground the angles of elevation of the top and bottom of the flagstaff are 60° and 30° respectively. Find the height of the tower and the distance of the point from the tower. (Take $\sqrt{3}=1.732$.)
2. At a point A, 20m above the level of water in a lake, the angle of elevation of a cloud is 30° . The angle of depression of the reflection of the cloud in the lake, at A is 60° . Find the distance of the cloud from A.
3. An observer, 1.7m tall, is $20\sqrt{3}$ m away from a tower. The angle of elevation from the eye of observer to the top of tower is 30° . Find the height of tower.
4. The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60° . From a point Y, 40m vertically above X, the angle of elevation of the top Q of tower is 45° . Find the height of the tower PQ and the distance PX.
5. A person standing between two poles, finds that the angle subtended at his eyes by the tops of the poles is a right angle. If the heights of the two poles are two times and four times the height of the person and the distance between the two poles is equal to the height of the higher pole, find the ratio of the distances of the person from the smaller to the bigger poles.
6. From a point on the ground, the angles of elevation of the bottom and top of a tower fixed at the top of a 20m high building are 45° and 60° respectively. Find the height of the tower.
7. The angles of depression of the top and bottom of a 50m high building from the top of a tower are 45° and 60° respectively. Find the height of the tower and the horizontal distance between the tower and the building.
8. A bird is sitting on the top of a 80m high tree. From a point on the ground, the angle of elevation of bird is 45° . The bird flies away horizontally in such a way that it remained at a constant height from the ground. After 2 seconds, the angle of elevation of the bird from the same point is 30° . Find the speed of flying of the bird.
9. A 1.5m tall boy is standing at some distance from a 30m 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.
10. A vertical tower stands on a horizontal plane and is surmounted by a flagstaff. At a point on the plane, 70m away from the tower, an observer notices that the angles of elevation of the top and the bottom of the flagstaff are respectively 60° and 45° , Find the height of the flagstaff and that of the tower.
11. Two men on either sides of a 75m high building and in line with base of building observe the angles of elevation of the top of the building as 30° and 60° respectively. Find the distance between the two men.

12. The tops of two poles of height 18m and 12m are connected by a wire. If the wire makes an angle 30° with the horizontal, find the length of the wire.
13. From the top of a building PQ 60m high, the angles of depression of the top and bottom of a vertical lamp post RS are observed to be 30° and 60° respectively. Find the horizontal distance between PQ and RS. Also, find the difference between the heights of the building and the lamp post.
14. Two poles of equal heights are standing opposite to each other on either side of the road which is 80m wide. From a point P between them on the road, the angle of elevation of the top of a pole is 60° and the angle of depression from the top of another pole at point P is 30° . Find the heights of poles and the distances of point P from the poles.
15. From the top of a tower, 100m high, a man observes two cars on opposite sides of the tower with the angles of depression as 30° and 45° respectively. Find the distance between the cars. (Take $\sqrt{3} = 1.73$).
16. A man standing on the deck of a ship, which is 10m above the water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30° . Find the distance of the hill from the ship and the height of the hill.
17. An aeroplane when flying at a height of 4000m from the ground passes vertically above another aeroplane at an instant when the angles of elevation of the two aeroplanes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the two aeroplanes at that instant.
18. The shadow of a tower, when the angle of elevation of the sun is 45° , is found to be 10m longer than when the angle of elevation is 60° . Find the height of the tower.