

TRIGONOMETRY

HEIGHTS AND DISTANCES

13

2m	2m	3m	4m	5m	6m
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4 MARK QUESTIONS

(Skill)

- From ship's mast need 50 mts high the angle of depression of a boat is observed to be 30° . Find its distance from the ship.
- What is the angle of elevation of the sun when the length of the shadow of a pole is $\frac{1}{\sqrt{3}}$ times the height of the pole?
- A kite flying at a height of h is tied to a thread which is 50m long. Assuming that there is no kink in the thread and it makes an angle of 30° with the ground. Find the height of the kite.
- A person standing on the bank of a river observes that the angle subtended by a tree on the opposite bank is 60° . When he returns 40 metres from the bank, he finds the angle to be 30° . Find the height of the tree and the breadth of the river.
- The angles of elevation of the top of a tower from the base and the top of a building are 60° and 30° . The building is 20 metres high. Find the height of the tower.
- The angles of elevation of the Summit of a hill from the top and the bottom of a tower are 30° and 60° respectively. If the height of the tower is h , show that the height of the hill is $\frac{3h}{2}$.
- A person is at the top of a tower 75 feet high, from there he observes a vertical pole and finds the angles of depressions of the top and the bottom of the pole which are 30° and 60° respectively. Find the height of the pole.
- Two towers of height 14m and 25m stand on level ground. The angles of elevation of their tops from a point on the line joining their feet are 45° and 60° respectively. Find the distance between the towers.
- The angles of depressions of two boats as observed from the mast head of a ship 50m high are 45° and 30° . What is the distance between the boats if they are on the same side of the mast head in line with it?
- The angles of elevation of the top of a tower from the base and the top of a building are 60° and 45° . The building is 20 metres high. Find the height of the tower.
- The shadow of a tower standing on a level plane is found to be 50 metres longer when Sun's altitude is 30° . Than when it is 60° . Find the height of the tower.

QUESTION BANK**II PUC**

12. An aeroplane when flying at a heights of 2000 metres passes vertically above another plane at an instant when their angles of elevation from the same point of observation are 60° and 45° respectively. Find the distance between the aeroplanes.
13. From a point on the line joining the feet of two poles of equal heights, the angles of elevation of the tops of the poles are observed to be 30° and 60° . If the distance between the poles is a Find (i) the height of the poles (ii) the position of the point of observation.
14. The angles of elevation of the top of a tower from two points distant a and b ($a < b$) from its foot and the same straight line from it are 30° and 60° . Show that the height of the tower is \sqrt{ab} .
15. A flag staff stands upon the top of a building. At a distance of 20 metres the angles of elevation of the top of the flag staff and building are 60° & 45° respectively. Find the height of the flag staff.
16. From the top of a cliff, the angles of depression of two boats in the same vertical plane as the observer are 30° and 45° . If the distance between the boats is 100 metres, find the height of the cliff.
17. From a point A due north of the tower, the elevation of the top of the tower is 60° . From a point B due south, the elevation is 45° , if $AB = 100$ metres. Show that the height of the tower is $50\sqrt{3}(\sqrt{3} - 1)$ metres.
18. A person at the top of a hill observes that the angles of depression of two consecutive kilometres stones on a road leading to the foot of the hill and in the same vertical plane containing the position of the observer are 30° and 60° . Find the height of the hill.
19. The angle of elevation of a tower from a point on the ground is 30° . At a point on the horizontal line passing through the foot of the tower and 100 metres nearer it, the angle of elevation is found to be 60° . Find the height of the tower and the distance of the first point from the tower.
20. A person is at the top of a tower 75 feet high from there he observes a vertical pole and finds the angles of depressions of the top and the bottom of the pole which are 30° and 60° respectively. Find the height of the pole.
21. The angle of elevations of the top of an unfinished tower at a point distance 120 mt from its base in 45° . How much higher must the tower be raised so that the angle of elevation at the same point may be 60° ?
22. A person standing on the bank of a river observes, that the angle subtended by a tree on the opposite bank is 60° . When he returns 40 meters from the bank he finds the angle to be 30° . Find the height of the tree and the breadth of the river.
23. From the top of a house 32 m high, the angle of elevation of the top of a tower is 45° and the angle of depression of the foot of the tower is 30° . Find the height of the tower.
24. The angle of elevation of an object from a point 100m above a lake is 30° and angle of depression of its image in the lake is 45° . Find the height of the object above the lake.
