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CBSE 10th Some Application of Trigonometry

Unsolved Paper

- Q.1** A tower stands vertically on the ground. From a point on the ground, 20 m away from the foot of the tower, the angle of elevation of the top of the tower is 60° . What is the height of the tower?
- Q.2** A ladder is placed along a wall of a house such that its upper end is touching the top of the wall. The foot of the ladder is 2 m away from the wall and the ladder is making an angle of 60° with the level of the ground. Determine the height of the wall.
- Q.3** A kite is flying at a height of 75 meters from the ground level, attached to a string inclined at 60° to the horizontal. Find the length of the string to the nearest meter.
- Q.4.** A vertical tower stands on a horizontal plane and is surmounted by a vertical flag-staff. At a point on the plane 70 metres away from the tower, an observer notices that the angles of elevation of the top and the bottom of the flag-staff are respectively 60° and 45° . Find the height of the flag-staff and that of the tower.
- Q.5.** A person observed the angle of elevation of the top of a tower as 30° . He walked 50 m towards the foot of the tower along level ground and found the angle of elevation of the top of the tower as $^\circ$. Find the height of the tower.
- Q.6.** A parachutist is descending vertically and makes angles of elevation of 45° and 60° at two observing points 100 m apart from each other on the left side of himself. Find the maximum height from which he falls and the distance of the point where he falls on the ground from the just observation point.
- Q.7.** The angle of elevation of the top of a tower from a point A on the ground is 30° . Moving a distance of 20 metres towards the foot of the tower to a point B the angle of elevation increases to 60° . Find the height of the tower & the distance of the tower from the point A.
- Q.8.** From the top of a building 15 m 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 building.

Q.9. The angles of depression of the top and bottom of 8 m tall building from the top of a multistoried building are 30° and 45° respectively. Find the height of the multistoried building and the distance between the two buildings.

Q.10 From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45° . Determine the height of the tower.

Q.11 The angle of elevation of the top of the building from the foot of the tower is 30° and the angle 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.

Question 12

A ladder rests against a wall at an angle α to the horizontal. Its foot is pulled away from the wall through a distance a , so that it slides a distance b down the wall making an angle β with the horizontal, Show that $\frac{a}{b} = \frac{\cos \alpha - \cos \beta}{\sin \beta - \sin \alpha}$

Question 13 :

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° with it. The distance between the foot of the tree to the point where the top touches the ground is 8m. Find the height of the tree.

Question 14:

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 1.5m, and is inclined at an angle of 30° to the ground, where ad for the elder children she wants to have a steep side at a height of 3m, and inclined at an angle of 60° to the ground. What should be the length of the slide in each case?

Question 15:

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° . Find the height of the tower.

Question 16:

A 1.5 m 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.

Question 17:

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 $^\circ$. If the tower is 50m high, find the height of the building.

Question 18:

Two poles of equal heights are standing opposite each other on either side of the road, which is 80m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30° , respectively. Find the height of poles and the distance of the point from the poles.

Question 19:

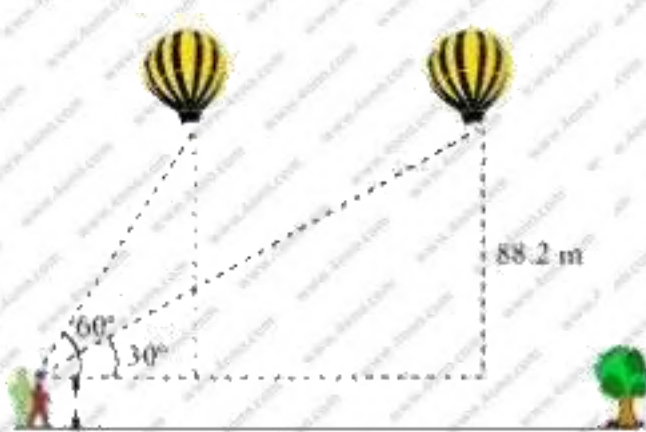
From the top of a 7m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45° . Determine the height of the tower.

Question 20:

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

Question 21:

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

**Question 22:**

The angles of depression of two ships from the top of a light house and on the same side of it re found to be 45° and 30° respectively. If the ships are 200m apart, find the height of the light house.

Question 23:

A flag-staff stands on the top of a 5 m high tower. From a point on the ground, the angle of elevation of the top of the flag-staff is 60° and from the same point, the angle of elevation of the top of the tower is 45° . Find the height of the flag-staff.

Question 24:

From the top of a building AB, 60 m high, the angles of depression of the top and bottom of a vertical lamp post CD are observed to be 30° and 60° respectively. Find

- (i) The horizontal distance between AB and CD.
- (ii) The height of the lamp post.
- (iii) The difference between the heights of the building and the lamp post.

Question 25:

A man-standing on the deck of a ship, which is 8 m above water level. He observes the angle of elevation of the top of a hill as 30° and the angle of depression of the base of the hill as 60° . Calculate the distance of the hill from the ship and the height of the hill.

Question 26:

From the top of a 50m high tower, the angles of depression of the top and bottom of a pole are observed to be 45° and 60° respectively. Find the height of the pole.

Question 27:

The angle of elevation of a stationary cloud from a point 2500m above a lake is 15° and the angle of depression of its reflection in the lake is 45° . What is the height of the cloud above the lake level? (Use $\tan 15^\circ = 0.268$)

Question 28:

From the top of a light house, the angles of depression of two ships on the opposite sides of it are observed to be α and β . If the height of the light house be h meters and the line joining the ships passes through the foot of the light house, show that the distance

$$\frac{h(\tan \alpha + \tan \beta)}{\tan \alpha \tan \beta} \text{ metres}$$

Question 29:

The angles of elevation of the top of a rock from the top and foot of a 100 m high tower are respectively 30° and 45° . Find the height of the rock.

Question30:

The length of the shadow of a tower standing on level plane is found to be $3x$ metres longer when the sun's altitude is 30° than when it was 45° . Prove that the height of tower is $x(\sqrt{3} + 1)$ metres.

Question 31

A man on the deck of a ship is 10m above the water level. He observes that the angle of elevation of the top of a cliff is 45° and the angle of depression of the base is 30° . Calculate the distance of the cliff from the ship and the height of the cliff.

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