

IITJEE Foundation Practice paper

SOME APPLICATIONS OF TRIGONOMETRY

class-10-Mathematics Number of Questions: 43

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1

The angle formed by the line of sight with the horizontal, when the point being viewed is above the horizontal level is called

- Obtuse angle Vertical angle Angle of depression Angle of elevation

2

The angle of elevation from a point 30 feet from the base of a pole, of height 'h' feet, as level ground to the top of the pole is 45° . Which equation can be used to find the height of the pole.

- $\cos 45^\circ = \frac{h}{30}$ $\tan 45^\circ = \frac{30}{h}$ $\tan 45^\circ = \frac{h}{30}$ $\sin 45^\circ = \frac{h}{30}$

3

A tower stands vertically on the ground from a point on the ground which is 15 m away from the foot of tower. If the height of tower is $15\sqrt{3}$ meters, then find the angle of elevation.

- 120° 60° 30° 90°

4

The length of a shadow of a tower on the plane ground is $\sqrt{3}$ times the height of the tower. The angle of elevation of sun is

- 60° 45° 30° 90°

5

A tower stands vertically on the ground, from a point on the ground which is 25 m away from the foot of tower. if the height of tower is $25\sqrt{3}$ meters, Find the angle of elevation.

- 60° 30° 120° 90°

6

A ladder leaning against a wall makes an angle of 30° with the wall. If its foot is 6.2 m away from the wall, then its length is

- 14.2 m 8 m 12.4 m 10.2 m

7

If the length of a shadow cast by a pole is $\sqrt{3}$ times the length of the pole, then the angle of elevation of the sun is

- 45° 60° 30° 90°

8

If the angle of the top of the 200 m high tower from a point C on the ground is 30°, the distance of the point C from the foot of the tower is (Take $\sqrt{3} = 1.732$)

- 246.6 m 173.6 m 346.4 m 300.4 m

9

A 20 m long ladder touches the wall at a height of 10 m. The angle which the ladder makes with the horizontal is

- 45° 30° 90° 60°

10

The ratio of the length of rod and its shadow is $1:\sqrt{3}$, then the angle of elevation of the sun is

- 60° 30° 45° 90°

11

If sun's elevation is 60° then a pole of height 6 meters will cast a shadow of length

- $3\sqrt{3}$ m $6\sqrt{3}$ m $2\sqrt{3}$ m $\sqrt{3}$ m

12

The angle of elevation from a point 30 meter from the base of tree as level ground to the top of the tree is 60° . The height of the tree is

- $60\sqrt{3}$ m $30\sqrt{3}$ m 30 m $\frac{30}{\sqrt{3}}$ m

13

A tree is broken by the wind. The top struck the ground at an angle of 30° and at a distance of 30 meters from the foot of the tree. The height of the tree in meters is

- $40\sqrt{3}$ $35\sqrt{3}$ $25\sqrt{3}$ $30\sqrt{3}$

14

A kite is flying, attached to a thread which is 165 meters long. The thread makes an angle of 30° with the ground. The height of the kite from the ground, assuming that there is no slack in the thread is

- 84 m 80 m 82.5 m 81.5 m

15

A tree casts a shadow 4 m long on the ground, when the angle of elevation of the sun is 45° . The height of the tree is

- 5.2 m 4 m 3 m 4.5 m

16

The angle of elevation of the sun when the length of the shadow of the tree is $\sqrt{3}$ times the height of the tree is

- 30° 90° 60° 45°

17

A tower stands vertically on the ground. From a point on the ground which is 25 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 45° , then the height of the tower is ____ (in meters)

- 25 $25\sqrt{3}$ 12.5 $25\sqrt{2}$

18

If the angles of depression from the top of a tower of height 40 m to the top and bottom of a tree are 45° and 60° respectively, then the height of the tree is

- $\frac{40}{3}(\sqrt{3} - 1)$ m $\frac{40}{3}(3 - \sqrt{3})$ m $\frac{20}{3}(\sqrt{3} + 3)$ m $\frac{20}{3}(\sqrt{3} + 1)$ m

19

A man is 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 60° and angle of depression of the base of the hill as 30° . What is the height of the hill?

- $8\sqrt{3}$ m 24 m 32 m $24\sqrt{3}$ m

20

A vertical tower is 20 m high. A man at some distance from the tower knows that the cosine of the angle of the elevation of the top of tower is 0.5. He is standing from the foot of the tower at a distance of

- $\frac{10}{\sqrt{3}}$ m $\frac{20}{\sqrt{3}}$ m $10\sqrt{3}$ m $20\sqrt{3}$ m

21

A tower stands vertically on the ground. From a point on the ground 30 m away from the foot of the tower, the angle of elevation of the top of the tower is 45° . The height of the tower will be

- $30\sqrt{3}$ m $40\sqrt{3}$ m 30 m 40 m

22

A man on a top of a tower observes a truck at an angle of depression " α " where $\tan \alpha = \frac{1}{5}$ and sees that it is moving towards the base of the tower. 10 minutes later, the angle of depression of the truck is found to be " β " where $\tan \beta = \sqrt{5}$ if the truck is moving at a uniform speed, then how much more time it will take to reach the base of the tower.

- $\frac{150}{\sqrt{3}}$ sec 1500 sec 150 sec $150\sqrt{5}$ sec

23

The horizontal distance between two towers is 140 m. The angle of

elevation of the top of the first tower when seen from the top of the second tower is 30° . If the height of the second tower is 60 m then, the height of the first tower is

- 140.83 m 135 m 139.5 m 142 m

24

If altitude of the sun is 60° , the height of a tower which casts a shadow of length 30 m is

- $\frac{30}{\sqrt{3}}$ m $30\sqrt{3}$ m 15 m $15\sqrt{2}$ m

25

An observer 1.5 m tall is 28.5 m away from a tower. The angle of elevation of the top of the tower from his eyes is 45° . The height of the tower is

- 10 m 40 m 30 m 20 m

26

The shadow of a flag pole is 30 meters. If the altitude of the sun is at 30° then the height of the flag pole is

- $30\sqrt{3}$ m $\frac{30}{\sqrt{3}}$ m $15\sqrt{3}$ m $\frac{15}{\sqrt{3}}$ m

27

Consider a ladder which makes an angle of 60° with a wall of height 10 m and its top just touches the top of the wall. If the ladder is now touches the top of the opposite wall which has a height of $10\sqrt{3}$ m, what is the angle by which the ladder is located ?

- 90° 60° 45° 30°

28

Two pillars are 'a' meters apart and the height of one is double that of the other. If from the mid-point of the line joining their feet an observer find the angle of elevation of their tops to be complementary, then the height of the smaller pillar is

- $\frac{a}{2\sqrt{2}}$ m $2a$ m a m $a\sqrt{2}$ m

29

If the angle of elevation of a cloud from a point 100 meters above a lake is 30° and the angle of depression of its reflection in the lake is 60° , then the height of the cloud above the lake is

- 30 m 100 m 200 m 500 m

30

A tree is broken by wind and its upper part touches the ground at a point 10 meters from the foot of the tree and makes an angle of 45° with the ground. Then entire height of the tree is

- 20 m $10(\sqrt{2} + 1)$ m 10 m $10\sqrt{2}$ m

31

A man has a height of 1.732 m. He observes the angle of depression of the head and foot of his son as 30 degrees and 60 degrees respectively. What is the height of his son? (Take $\sqrt{3} = 1.732$)

- 3.464 m 3 m 1.732 m 1.155 m

32

Height of a light house is 65 m. Angle of elevation and depression of top and foot of a radarmast are 60° and 30° respectively. Then the Height of radarmast is

- 206 m 260 m 209 m 290 m

33

A house is built on the top of cliff. From foot of the cliff at a distance of 75 m, the angle of elevation of top of house is 60° and the angle of elevation of top of cliff is 30° . Then the height of house is

- 50 m $50\sqrt{3}$ m 25 m $25\sqrt{3}$ m

34

From the top of a mountain 68 m high, the angle of depression of two boats due east of it are 60° and 30° respectively. Then the distance between the ships is

- 100 m $100\sqrt{3}$ m 200 m $\frac{136}{\sqrt{3}}$ m

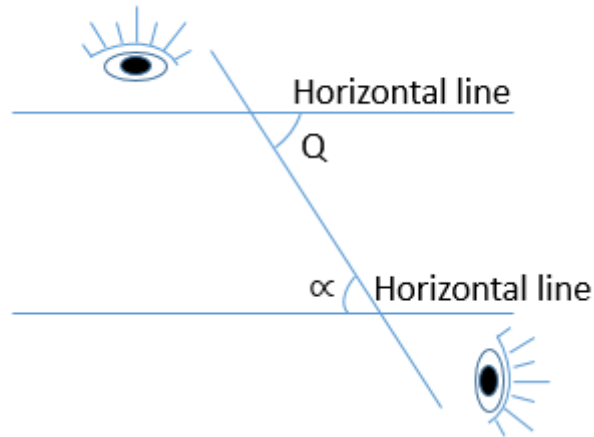
35

If the height of the wind mill is 65 m and its shadow is $65\sqrt{3}$ m, then the angle of elevation of sun at that particular moment is

- 90° 45° 60° 30°

36

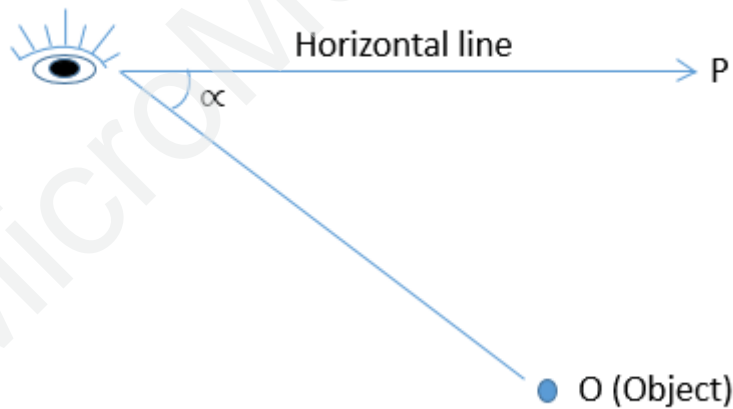
From the given figure, Q and α respectively are



- Angle of Depression and Angle of Depression
 Angle of Elevation and Angle of Elevation
 Angle of depression and Angle of Elevation Angle of depression and Angle of Elevation
 Angle of Elevation and Angle of depression

37

In the following α is



- Angle of Depression Angle of Depression Angle of Deviation Angle of Elevation
 Angle of incidence

38

A person standing on the bank of the river observes that the angle of elevation of a tree on the opposite bank is 60° when he re-starts 20 m from the bank he finds the angle of elevation to be 30° , Find the width of the river.

- 25 m 10 m 15 m 20 m

39

Two pillars of equal height are on either side of a road which is 100 m wide. The angle of elevation of the tops of the pillars at a point on the road between the pillars are 60° and 30° . Find the height of the pillar.

- $20\sqrt{3}$ $15\sqrt{3}$ 25 $25\sqrt{3}$

40

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

- 100 120 110 130

41

From a point on the ground the angle of elevation of the bottom and top of a transmission tower fixed at the top of 20 m high building are 45° and 60° respectively. Find the height of the transmission tower.

- 14.64 m $20\sqrt{3}$ 12.34 m 15.64 m

42

As observer from the top of a 75 m tall light house, 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 light house, find the distance between two ships.

- $70(\sqrt{3} - 1)$ m $50(\sqrt{3} - 1)$ m $25(\sqrt{3} - 1)$ m $75(\sqrt{3} - 1)$ m

43

A circus artist is climbing a 20 meters 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° .

- 10 m 15 m 20 m $10\sqrt{3}$ m

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