PRERNA EDUCATION

IIT/ MEDICAL/ FOUNDATION

SAMPLE QUESTIONS

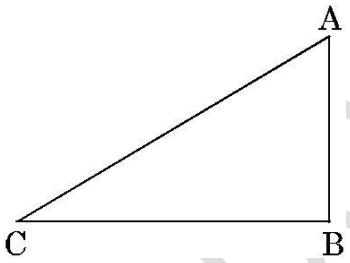
APPLICATION OF TRIGONOMETRY

Q.No. 1 The tops of two towers of height x and y, standing on level ground, subtend angles of $30°$ and $60°$ respectively at the centre of the line joining their feet, then find x : y.

(a) 1 :3 (b) 1 : 2 (c) $1:\sqrt{3}$ (d) 1 : 4

Ans. (a)

Q.No. 2 If figure , a tower AB is 20 m high and BC, its shadow on the ground, is $20\sqrt{3}$ m long. Find the Sun's altitude.



(a) $30°$ (b) $60°$ (c) $45°$ (d) None

Ans. (a)

Q.No. 3 The angle of depression and the angle of elevation from an object on the ground to an object in the air are related as:

(a) greater than (b) less than (c) equal (d) all of them

Ans. (c)

Q.No. 4 If the string of a kite is 75 m long and it makes an angle of 60 with the ground, then the height of kite is:

(a) $\frac{75}{2}$ (b) $75\sqrt{3}$ m (c) $\frac{75\sqrt{3}}{2}$ m (d) 75 m

Ans. (c)

Q.No. 5 A 6 ft tall man finds that the angle of elevation of a 24 ft high pillar and the angle of depression of its base are complimentary angles. The distance of the man from the pillar is:

(a) $6\sqrt{3}m$ (b) $18\sqrt{3}m$ (c) $7\sqrt{3}m$ (d) None

Ans. (b)

Q.No. 6 A tree broken due to storm and the broken part bends, so that the top of the tree touches the ground making on angle $30°$ with it . The distance between the foot at the three to the point where the top touches the ground is 8m the height of the tree will be

(a) $6\sqrt{3}m$ (b) $7\sqrt{3}m$ (c) $5\sqrt{3}m$ (d) None of these

Ans. (d)

Q.No. 7 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 $45°$. If the tower is 30 m high, find the height of the building.

(a) $10\sqrt{3}$ (b) $8\sqrt{3}$ (c) $6\sqrt{3}$ (d)None of these

Ans. (a)

Q.No. 8 The angle of elevation of an aeroplane from a point A on the ground is 60^0. After a flight of 15 seconds, the angle of elevation changes to 30^0. If the aeroplane is flying at a constant height of $1500\sqrt{3}$ m, find the speed of the plane in km/hr.

(a) 720 km/hr (b) 600 km/hr (c)500 km/hr (d) None of these

Ans. (a)

Q.No. 9 From the top of a tower of height 50m, the angles of depression of the top and bottom of a pole are $30°$ and $45°$ respectively. Find

(i) how far the pole is from the bottom of a tower,

(ii) the height of the pole. (Use $\sqrt{3} = 1.732$)

(a) 50m, 20 m (b)50m, 21.13m (c) 30m, 25m (d) None of these

Ans. (b)

Q.No. 10 A vertical tower A vertical tower stands on a horizontal plane and is surmounted by a vertical flagstaff of height 5 m. From a point on the plane the angles of elevation of the bottom and top of the flagstaff of height 5 m. From a point on the plane the angles of elevation of the bottom and top of the flagstaff are respectively 30^0 and 60^0. Find the height of the tower.

(a) 3.5 m (b)2.5 m (c)4.5 m (d) 1.5 m

Ans. (b)

Q.No. 11 From the top of a hill 200 m high, the angles of depression of the top and the bottom of a pillars are 30^0 and 60^0 respectively. Find the height of the pillar and its distance from the hill

(a)157 m, 148m (b)122.33m , 113.33m

(c)148m, 133m (d)None of these

Ans. (d)

Q.No. 12 A pole A pole 5 m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point A on the ground is 60^0 and the angle of the depression of point A from top of the tower is 45^0 . Find the height of the tower. $\left(\text{Take } \sqrt{3} = 1.732\right)$

(a)7.8 m (b)6.8m (c) 5.8m (d)4.8m

Ans. (b)

Q.No. 13 The angle of depression of the top and the bottom of a building 50 meters high as observed from the top of a tower are 30^0 and 60^0 respectively. Find the height of the tower and the horizontal distance between the building and the tower. $\left(\text{Take } \sqrt{3} = 1.73\right)$

(a) 75m, 40m (b)70m, 43.25m (c)75m, 43.25m (d)70m, 40m

Ans. (c)

Q.No. 14 The length of a shadow of a tower standing on level plane is found to be 20 m longer

when the Sun's altitude is 30^0 , than when it was 60^0 . Find the height of the tower.
(a) 18m (b) 17m (c) 17.3m (d) 18.3m

Ans. (c)

Q.No. 15 From a point P on the ground the angle of elevation of the top of a tower is $30°$ and that of that of the top of a flag staff fixed on the top of the tower, is $60°$. If the length of the flag staff is 5m, find the height of the tower.
(a)2.5m (b)3.5m (c) 4.5m (d)None

Ans. (a)

Q.No. 16 At a point A, 20 metres above the level of water in a lake, the angle of elevation of 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.
(a) 30m (b)40m (c) 50m (d)60.3m

Ans. (b)

Q.No. 17 An aeroplane flying at a height of 4000 m from the groun d passes vertically above another aeroplane at an instant when the angle of elevation of the two planes from the same point as the ground are 60^0 and 45^0 respectively. Find the vertical distance between the aeroplanes at that instant.
(a) 1500.4m (b)1790.4m (c)1890.4m (d)1690.4m

Ans. (d)

Q.No. 18 There are two windows in a house. A window of the house is at a height of 1.5 m above the ground and the other window is 3 m vertically above the lower window. Ram and Shyam are sitting inside the two windows. At an instant, the angle of elevation of a balloon from these windows are observed as 45^0 and 30^0 respectively.
Read the above passage and answer the following questions:
(i) Find the height of the balloon from the ground.
(ii) Among Ram and Shyam, who is more closer to the balloon?

(a) 8m, Ram (b) 9m, Shyam (c) 7m, Ram (d) None of these

Ans. (b)

Q.No. 19 The angle of elevation of the top of a tower as observed from a point won the ground is "α" and moving "a" meters towards the tower, the angle of elevation is "B" Then height of tower will.
(a) $\dfrac{\tan\alpha\tan\beta}{a(\tan\alpha-\tan\beta)}$ (b) $\dfrac{a\tan\alpha}{\tan\beta}(\tan\alpha-\tan\beta)$
(c) $\dfrac{a\,tan\alpha\,tan\beta}{tan\alpha-tan\beta}$ (d) None of these

Ans. (c)

Q.No. 20 A man standing on the deck of a ship, which is 10 m above the water level, observes the angle of elevation of the top of the hill as 60^0 and the angle of depression of the base of the hill as 30^0. Calculate the distance of the hill from the ship and the height of the hill.
(a) 17.3 m, 40m (b)15m, 40m (c)can't be determined (d) None

Ans. (a)