



MATHS

BOOKS - OSWAL PUBLICATION

SOME APPLICATIONS OF TRIGONOMETRY (HEIGHTS AND DISTANCES)

Stand Alone Mcqs

1. A pole of height 6 m casts a shadow $2\sqrt{3}$ m long on the ground. Find the sun's elevation.

A. 60°

B. 45°

C. 30°

D. 90°

Answer: A



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2. If the height of a vertical pole is $\sqrt{3}$ times the length of its shadow on the ground then the angle of elevation of the sun at that time is

A. 30°

B. 60°

C. 45°

D. 75°

Answer: B



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3. The length of a string between a kite and a point on the ground is 90 metres. If the string makes an angle θ with the ground level such that $\tan \theta = \frac{15}{8}$, how high is the kite?

Assume that there is no slack in the string.

A. 75 m

B. 79.41 m

C. 80 m

D. 72.5 m

Answer: A



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4. The angle of depression of a car parked on the road from the top of the 150 m high tower is 30° . Find the distance of the car from the tower

A. $50\sqrt{3}$

B. $150\sqrt{3}$

C. $150\sqrt{2}$

D. 75

Answer: B



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5. A ladder makes an angle of 60° with the ground when placed against a wall. If the foot of the ladder is $2m$ away from the wall, the length of the ladder is

A. $4\sqrt{3}m$

B. $\frac{4}{\sqrt{3}}$ m

C. 4 m

D. $2\sqrt{2}$ m

Answer: C



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6. The shadow of a 5-m-long stick is 2m long.

At the same time, the length of the shadow of

a 12.5m high tree is

A. 3m

B. 3.5 m

C. 5 m

D. 4.5 m

Answer: C



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7. A pole casts a shadow of length $2\sqrt{3}$ m on the ground when the sun's elevation is 60° .

The height of the pole is

A. 3m

B. 12m

C. $4\sqrt{3}$ m

D. 6m

Answer: D



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8. The length of a vertical rod and its shadow are in the ratio $1 : \sqrt{3}$. The angle of elevation of the sun is

A. 30°

B. 45°

C. 60°

D. 90°

Answer: A



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Assertion And Reason Based Mcqs

1. Assertion (A): The angle of elevation of the top of the tower from a point on the ground, which is 30 m away from the foot of the tower, is 30° . The height of the tower is 10 m.

Reason (R): The angle of depression from B to A and Angle of elevation from A to B are equal.

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is not correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Answer: D



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2. The angle of elevation of a tower from two points which are at distances 9 m and 64 m from the foot of the tower on the opposite sides are complementary. The height of the tower is ___



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3. If the height of a vertical pole is equal to the length of its shadow on the ground, the angle of elevation of the sun is

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is not correct explanation of A.

C. A is true but R is false.

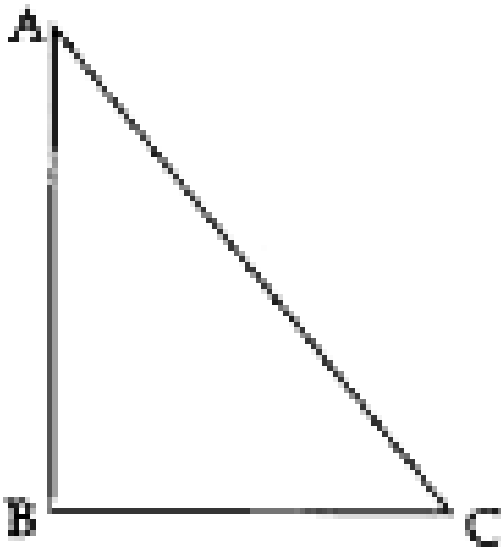
D. A is false but R is true.

Answer: B



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4. Assertion (A): In the figure, if $BC = 20$ m and $\angle ACB = 30^\circ$ then height AB is 11.56 m



Reason (R) : $\tan \theta = \frac{AB}{BC} = \frac{\text{Perpendicular}}{\text{Base}}$,

where θ is the angle $\angle ACB$.

A. Both A and R are true and R is the correct explanation of A.

B. Both A and R are true and R is not correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Answer: A



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Case Based Mcqs

1. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of

30° , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depres

A. 2 sec

B. 3 sec

C. 6 sec

D. 4 sec

Answer: B



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2. Write the value of $\sec 30^\circ$.

A. $\frac{2}{\sqrt{3}}$

B. $\frac{\sqrt{3}}{2}$

C. $\frac{1}{\sqrt{3}}$

D. $\sqrt{3}$

Answer: A



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3. Write the value of $\operatorname{cosec} 60^\circ$.

A. $\sqrt{3}$

B. $\frac{2}{\sqrt{3}}$

C. $\frac{\sqrt{3}}{2}$

D. $\frac{1}{\sqrt{3}}$

Answer: B



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4. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of

30° , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression

A. horizontal line

B. Vertical line

C. Line of sight

D. Parallel lines

Answer: C



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5. A straight highway leads to the foot of a tower of height 50 m. From the top of the tower, the angles of depression of two cars standing on the highway are 30° and 60° respectively. What is the distance between the two cars and how far is each car from the tower?

A. different

B. equal

C. opposite

D. None of these

Answer: B



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6. From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30° . A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is 45° . Find the length of the flagstaff

A. 6.32 m

B. 7.32 m

C. 8.32 m

D. 9.32 m

Answer: B



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7. From a point P on the ground the angle of elevation of a 10m tall building is 30° . A flag is hoisted at the top of the building and the angle of elevation of the top of the flag-staff

from P is 450 . Find the length of the flag-staff and the distance of the building from the point P . (Take $\sqrt{3} = 1.732$) .

A. 17.32 m

B. 18.32 m

C. 19.32 m

D. 20.32 m

Answer: A



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8. What is the value of $\tan 30^\circ$?

A. 1

B. $\frac{\sqrt{3}}{2}$

C. $\sqrt{3}$

D. $\frac{1}{\sqrt{3}}$

Answer: D



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9. What is the value of $\tan 45^\circ$?

A. 2

B. 0

C. 1

D. $\frac{\sqrt{3}}{2}$

Answer: C



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10. From a point P on the ground the angle of elevation of the top of a 10 m tall building is 30° . A flag is hoisted at the top of the building

and the angle of elevation of the top of the flagstaff from P is 45° . Find the length of the flagstaff

A. $BP^2 = AB^2 + AP^2$

B. $AB^2 = AP^2 + BP^2$

C. $AP^2 = AB^2 + BP^2$

D. None of these

Answer: A



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11. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45° , respectively. If the bridge is at a height of 3 m from the banks, find the width of the river.

A. $1(\sqrt{3} + 1)m$

B. $(\sqrt{3} + 1)m$

C. $(\sqrt{3} + 2)m$

D. $3(\sqrt{3} + 1)m$

Answer: D



12. From a point of a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45° , respectively.

If the bridge is at a height of 10 m from the banks, then find the width of the river. (Use

$$\sqrt{3} = 1.73)$$

- A. Acute angled triangle
- B. Right angled triangle
- C. Obtuse angled triangle

D. Equilateral triangle.

Answer: B



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13. From a point on a bridge across river, the angles of depression of the banks on opposite sides of the river are 30° and 45° respectively. If the bridge is at a height of 3 m from the banks, find the width of the river.

A. $\frac{AD}{DP}$

B. $\frac{AP}{AD}$

C. $\frac{PD}{AD}$

D. $\frac{AD}{AP}$

Answer: C



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14. Find the value of,

$$2\tan 45^\circ + \cos 30^\circ - \sin 60^\circ.$$

A. 0

B. 2

C. 1

D. $\frac{1}{\sqrt{3}}$

Answer: C



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15. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45° , respectively.

If the bridge is at a height of 3 m from the banks, find the width of the river.

A. $\frac{\text{Perpendicular}}{\text{Base}}$

B. $\frac{\text{Base}}{\text{Perpendicular}}$

C. $\frac{\text{Hypotenuse}}{\text{Base}}$

D. $\frac{\text{Perpendicular}}{\text{Hypotenuse}}$

Answer: A



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