MATHS

BOOKS - ARIHANT PUBLICATION JHARKHAND

HEIGHT AND DISTANCE

Examples

1. The string of a kite is 150 m long and it makes an angle 60° with the horizontal. Find

the height of the kite above the ground. (Assume string to be tight)

A. 75 m

B. $75\sqrt{3}m$

C. 80 m

D. $80\sqrt{3}m$

Answer: B

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2. The angle of elevation of the top of a tower of height $100\sqrt{3}m$ from a point at a distance of 100 m from the foot of the tower on a horizontal plane is

A. 60°

B. 90°

C. 120°

D. 180°

Answer: A

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Exam Booster For Cracking Exam

1. At a point 20 m away from the foot of a tower, the angle of elevation of the top of the tower is 30° The height of the tower is

A. $20\sqrt{3}m$

B. $\frac{20}{\sqrt{3}}m$

C. $\frac{\sqrt{3}}{20}m$

D. None of these

Answer: B

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2. An electric pole is 10m high. A steel wire tied to top of the pole is affixed at a point on the ground to keep the pole up right. If the wire makes an angle of $45o$ with the horizontal through the foot of the pole, find the length of the wire.

A. $\frac{10}{\sqrt{2}}m$

B. 20 m

C. 14 m

D. $10\sqrt{2}m$

Answer: D

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3. The angle of elevation of the Moon when the length of the shadow of a pole is equal to its height, is

A. 60°

B. 45°

C. 90°

D. 30°

Answer: B

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4. The angle of elevation of a tower from a distance 200 m from its foot is 30°, Height of the tower is

A. $100\sqrt{3}m$

B. $\frac{200}{\sqrt{3}}m$

C. $200\sqrt{3}m$

D. $\frac{100}{\sqrt{3}}m$

Answer: B

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5. If the length of shadow of a pole on a level ground is twice the length of that pole, the angle of elevation of the Sun is

A. 60°

B. 30°

C. 45°

D. None of these

Answer: D

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6. The angle of elevation of the top of a hill from the foot of a tower is 60° and the angle of elevation of the top of the tower from the

foot of the hill is 30°. If the tower is 50 m high, then what is the height of the hill?

A. $100\sqrt{3}m$

B. $50\sqrt{3}m$

C. 150m

D. $\frac{150}{\sqrt{3}}m$

Answer: C

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7. A person of height 2m wants to get a fruit which is on a pole of height $\left(\frac{10}{3}\right)m$. If he stands at a distance $\left(\frac{4}{\sqrt{3}}\right)$m from the foot of the pole, then the angle at which he should throw the stone, so that it hits the fruit is

A. 60°

B. 45°

C. 90°

D. 30°

Answer: D

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8. A straight highway leads to the foot of a tower of height 50 m. From the top of 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. $\frac{100}{\sqrt{3}}m$

B. $100\sqrt{3}m$

C. $86.50m$

D. None of these

Answer: A

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9. From the top of a pillar of height 20 m, the angles of elevation and depression of the top and bottom of another pillar are 30° and 45°,

respectively. Then, the height of the second pillar (in m) is

A. $\frac{20}{\sqrt{3}}(\sqrt{3}-1)$

B. $\frac{20}{\sqrt{3}}(\sqrt{3}+1)$

C. $20\sqrt{3}$

D. $\frac{20}{\sqrt{3}}$

Answer: A

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10. From a point A on the ground , the angles of elevation of the top of a 10 m tall building and a helicopter hovering at some height of the building are 30° and 60° respectively. Find the height of the helicopter above the building

A. $\frac{10}{\sqrt{3}}m$

B. $10\sqrt{3}m$

C. $\frac{30}{\sqrt{3m}}m$

D. $30m$

Answer: D

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11. A vertical tower stands on a horizontal plane and surmounted by a flagstaff of height 'h'. At a point on the plane. The angle of elevation of bottom of the flagstaff is α and that of the top of the flagstaffis β. Find the height of the tower :

A. h tan α

B. $\frac{h\tan\alpha}{\tan\beta-\tan\alpha}$

C. $\frac{h\tan\alpha}{\tan\alpha-\tan\beta}$

D. None of these

Answer: B

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12. A man on the top of a tower: standing on the seashore: finds that a boat coming towards him takes 10 min for the angle of depression to change from 30 to 60. Find the

time taken by the boat to reach the shore from this position

A. 5 min

B. 10 min

C. $\sqrt{3}$ min

D. None of these

Answer: A

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13. From a window (h metres high above the ground) of a house in a street, the angle of elevation and depression of the top and the foot of another house on the opposite side of the street are θ and ϕ respectively. Show that the height of the opposite house is $h(1 + \tan\theta \cot\phi)$ metres.

A. $h \cot\theta \cot\phi$

B. $h(\cot\theta \cot\phi + 1)$

C. $h \tan\theta \cot\phi$

D. $h(\tan\theta\cot\phi+1)$

Answer: D

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14. Two persons are 'a' meters apart and the height of one is double that of the other, if from the middle point of the line joining their feet, an observer find the angular elevation of their tops to be complementary then the height of shorter person is :

A. K/2m

B. $\frac{K}{2\sqrt{2}}m$

C. K m

D. None of these

Answer: B

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15. A flag staff of 5m high stands on a building of 25m high. At an observer at a height of 30 m. The flag staff and the building subtend

equal angles . The distance of the observer from the top of the flag staff is

A. 5m

B. $5\sqrt{3}m$

C. $5\sqrt{3/2m}$

D. None of these

Answer: C

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16. If a flag-staff of 6 m height placed on the top of a tower throws a shadow of $2\sqrt{3}$ m along the ground, then what is the angle that the sun makes with the ground?

A. 60°

B. 30°

C. 90°

D. None of these

Answer: A

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17. An aeroplane flying horizontally , 1km above the ground , is observed at an elevation of 60° ,after 10 seconds , its elevation is observed to be 30° . Find the speed of the aeroplane in km/hr.

A. 240

B. $240\sqrt{2}$

C. $240\sqrt{3}$

D. None of these

Answer: C

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18. The angle of elevation of a cloud from a height h above the level of water in a lake is α and the angle of depressionof its image in the lake is β. Find the height of the cloud above the surface of the lake:

A. $h \cot \beta$

B. $h(\cot \alpha + \cot \beta)$

C. $h \cot \alpha$

D. $h\left(\frac{\cot \alpha + \cot \beta}{\cot \alpha - \cot \beta}\right)$

Answer: D

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