MATHS

BOOKS - VGS BRILLIANT MATHS (TELUGU ENGLISH)

APPLICATIONS OF TRIGONOMETRY

Example

1. The top of a clock tower is observed at angle of elevation of α° and the foot of the tower is

at the distance of d meters from the observer.

Draw the diagram for this data.

2. Rinky observes a flower on the ground from the balcony of the first floor of a building at an angle of depression $\beta°$. The height of the first floor of the building is x meters. Draw the diagram for this data.

3. A large balloon has been tied with a rope and it is floating in the air. A person has observed the balloon from the top of a building at angle of elevation of θ_1 and foot of the rope at an angle of depression of θ_2. The height of the building is h feet. Draw the diagram for this data.

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4. A boy observed the top of an electric pole at an angle of elevation of $60°$ when the

observation point is 8 meters away from the foot of the pole. Find the height of the pole.

5. Rajender observes a person standing on the ground from a helicopter at an angle of depression $45°$. If the helicopter flies at a height of 500 meters from the ground, what is the distance of the person from Rajender?

6. Two men on either side of a temple of 30 meter height observe its top at the angles of elevation $30°$ and $60°$ respectively. Find the distance between the two men.

7. A straight highway leads to the foot of a tower. Ramaiah standing at the top of the tower observe a car at an angle of depression $30°$. The car is approaching the foot of the tower with a uniform speed. Six seconds later,

the angle of depression of the car is found to be $60°$. Find the time taken by the car to reach the foot of the tower from this point.

Do This

1. Draw diagram for the following situtions :

A person is flying a kite at an angle of elevation α and the length of thread from his hand to kite is 'l'.

2. Draw diagram for the following situtions :

A person observes two banks of a river at angles of depression θ_1 and $\theta_2 (\theta_1 < \theta_2)$ from the top of a tree of height 'h' which is at a side of the river. The width of the river is 'd'.

Think Discuss

1. Top of a building was observed at an angle of elevation α from a point. Which is at distance 'd' meters from the foot of the building. Which trigonometrical ratio should be considered for finding height of buildings?

2. A ladder of length x meter is leaning against a wall making angle θ with the ground. Which trigonometric ratio would you like to consider

to find the height of the point on the wall at which the ladder is touching?

Exercise 12 1

1. A tower stands vertically on the ground. From a point which is 15 meter away from the foot of the tower, the angle of elevation of the top of the tower is $45°$. What is the height of the tower?

2. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground by making $30°$ angle with the ground. The distance between the foot of the tree and the top of the tree on the ground is 6m. Find the height of the tree before falling down.

3. A contractor wants to set up a slide for the children to play in the park. Hed wants to set it up at the height of 2m and by making an angle of $30°$ with the ground. What should be the length of the slide?

4. Length of the shadow of a 15 meter high pole is $5\sqrt{3}$ meters at 7 o'clock in the morning.

Then, what is the angle of elevation of the Sun rays with the ground at the time?

5. You want to erect a pole of height 10 m with the support of three ropes. Each rope has to make an angle $30°$ with the pole. What should be the length of the rope?

6. Suppose you are shooting an arrow from the top of a building at a height of 6 m to a target on the ground at an angle of depression of $60°$. What is the distance between you and the object ?

7. An electrician wants to repair an electric connection on a pole of height 9m. He needs to reach 1.8 m below the top of the pole to do

repair work. What should be the length of the ladder which he should use, when he climbs it at an angle of $60°$ with the ground? What will be the distance between foot of the ladder and foot of the pole?

8. A boat had to cross a river. It crosses the river by making an angle of $60°$ with the bank of the river due to the stream of the river and travel a distance of 600 m to reach the

another side of the river. What is the width of the river ?

9. An observer of height 1.8 m is 13.2 m away from a palm tree. The angle of elevation of the top of the tree from his eyes is $45°$. What is the height of the palm tree ?

10. In the given figure, AC= 6 cm, AB= 5 cm and $\angle BAC = 30°$. Find the area of the triangle.

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Exercise 12 2

1. A TV tower stands vertically on the side of a road. From a point on the other side directly opposite to the tower, the angle of elevation of the top of tower is $60°$. From another point

10 m away from this point, on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is $30°$. Find the height of the tower and the width of the road.

2. A 1.5 m tall boy is looking at the top of a temple which is 30 m in height from a poin at certain distance. The angle of elevation from his eye to the top of the crown of the temple

increases from $30°$ to $60°$ as he walks towards the temple. Find the distance he walked towards the temple.

3. A statue stands on the top of a 2m tall pedestal. From a point on the ground, the angle of elevation of the top of the statue is $60°$ and from the same point the angle of elevation of the top of the pedstal is $45°$. Find the height of the statue.

4. From the top of a building, the angle of elevation of the top of a cell tower is $60°$ and the angle of depression to its foot is $45°$. If distance of the building from the tower is 7m, then find the height of the tower.

5. A wire of length 18m had been tied with electric pole at an angle of elevation $30°$ with

the ground. As it is covering a long distance, it was cut and tied at an angle of elevation $60°$ with the ground. How much length of the wire was cut?

6. 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 $60°$. If the

tower is 30m high, find the height of the building.

7. Two poles of equal height are standing opposite to each other on either sidef of the road, which is 120 feet wide. From a point between then on the road, the angles of elevation of the top of the poles are $60°$ and $30°$ respectively. Find the height of

the poles and the distances of the point from

the poles.

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8. The angles of elevation of the top of a tower

from two points at a distance of 4m and 9m,

find the height of the tower from the base of

the tower and in the same straight line with it

are complementary.

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9. The angle of elevation of a jet plane from a point A on the ground is $60°$. After a flight of 15 seconds, the angle of elevation changes to $30°$. If the jet plane is flying at a constant height of $1500\sqrt{3}$ m, find the speed ot the jet plane.

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Optional Exercise

1. A 1.2m 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 sometimes, the angle of elevation reduces to $30°$. Find the distance travalled by the balloon during the interval.

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2. The angle of elevation of the top of a tower from the foot of the building is $30°$ and the angle of elevation of fhe top of the building from the foot of the tower is $60°$. What is the ratio of heights of tower and building?

3. The angles of elevation of the top of a lighthouse from 3 boats A,B and C in a straight line of same side of the lighthouse are a,2a,3a

respectively. If the distance between the boats A and B is x meters. Find the height of lighthouse.

4. Inner part of a cupboard is in the cuboidical shape with its length, breadth and height in the ratio $1 : \sqrt{2} : 1$. What is the angle made by the longest stick which can be inserted cupboard with its base inside?

5. An iron spherical ball of volume 232848 cm^3 has been melted and converted into a cone wih the vertical angle of $120°$. What are its height and base?

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Observation Material

1. A boy observed the top of an electric pole at an angle of elevation of $30°$, when the

observation point is 10 meters away from the foot of the pole. Draw suitable diagram for the above sitution.

2. A person from the top of a building of height 25 m has observed another building top and bottm at an angle of elevation $45°$ and at an angle of depression $60°$ respectively. Draw the diagram for this data.

3. A person observed the top of a tree at an angle of elevation of $60°$ when the observation point was 5m away from the foot of the tree. Draw a diagram for this data.

4. If the angle of elevation of sun increases from '0' to 90 then the length of shadow of a tower decreases. Is this true? Justify your answer.

5. If a tower of height 'h' is observed from a point with a distance 'd' and angle 'θ' , then express the relation among h,d, θ.

6. A pole and its shadow have same length, find the angle of the sun ray made with the earth at that time.

7. A flag pole 4m tall casts a 6m shadow. At the same time. A nearby building casts a shodow of 24 m. How tall is the building?

8. A tower is $100\sqrt{3}$ high. Find the angle of elevation of its top when observed from a point 100m away from the foot of the tower.

9. A ladder of 3.9 m length is laid against a wall. The distance between the foot of the wall and the ladder is 1.5 m. Find the height at which the ladder touches the wall.

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10. A boat has to cross a river. It crosses river by making an angle of $60°$ with bank, due to the stream of river it travels a distance of

450m to reach another side of river. Draw a diagram to this data.

11. A person 25 m away from a cell tower observes the top of cell tower at an angle of elevation $30°$. Draw the suitable diagram for this situation.

12. A straight highway leads to foot of the tower. A man standing at the top of the tower observes a car at an angle of depression of θ, which is approaching the foot of the tower with a uniform speed. Six seconds later the angle of depression is ϕ. Draw a diagram for this data and analyze.

13. From the top of a tower of h m height, Anusha observes the anges of depression of two points X and Y on the same side of tower on the ground to be α and β. Draw the suitable figure for the given information.

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14. Rehman observed the top of a temple at an angle of elevation of $30°$, when the

observation point is 24m. Away from the foot of the temple. Find the height of the temple.

15. An observer flying in an aeroplane at an altitude of 900 m observes two ships in front of him, which are in the same direction at an angles of depression of $60°$ and $30°$ respectively. Find the distance between the two ships.

16. A person from the top of a building height 15 m observes the top and the bottem of a cell tower with the angle of elevation as $60°$ and the angle of depression as $45°$ respectively. Then find the height of the that cell tower.

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17. Two poles of equal height are standing opposite to each other on either side of the road, which is 80 m wide. From a point

between then on the road, the angles of elevation of top of the poles are $60°$ and $30°$. Find the height of poles.

18. A tree is breaken without separating from the stem by the wind. The top touches the ground making an angle $30°$ at a distance of 12m from the foot of the tree. Find the height of the tree before breaking.

19. Two poles are standing opposite to each other on either sidef of the road which is 90 feet wide.The angle of elevation from bottom of first pole to top of second pole is $45°$, the angle of elevation from bottom of second pole to top of first pole is $30°$. Find the heights of poles.

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20. The angle of the elevation of the top of a tower from two points at a distance of 4m and 9m from the base of the tower and in the same straight line with it, are complementary. Prove that the height of the tower is 6m.

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21. From the top of a tower of 50m high, Neha observes the angles of depression of the top and foot of another building to be

$45°$ and $60°$ respectively. Find the height of the building.

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1. A pole is arranged from a height of 30m from the ground, making $60°$ angle with earth. Then what is its length?

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2. A long pole is broken in a storm. Top end of the broken pole touched the head of a man at a distance of 'd'. Then find the angle between the man and the pole that before storm.

3. A kite is flown from a building with a height (h) m with a long rope. Now the kite, and the person having it are observed with angles of elevation α and β respectively by a boy. The

distance between boy and building is 'x' m. So draw a diagram for this data.

4. A person observes tops of two buildings with an angle of elevations $35°$ and $46°$ from the mid point in between them. So which building is higher? Why?

5. A 15 m long pole forms $5\sqrt{3}$ m long shadow at 8 AM in the morning. Then find the angle made by sun rays with earth.

6. A right circular cylindrical tower, height 'h' and radius 'r', stands on the ground. Let 'P' be a point in the horizontal plane ground and ABC be the semi-circular edge of the top of the tower such that B is the point in it nearest to

P. The angles of elevation of the points A and B are $45°$ and $60°$ respectively. Show that $\dfrac{h}{r} = \dfrac{\sqrt{3}\left(1 + \sqrt{3}\right)}{2}$.

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Public Examination

1. The ratio of the length of a rod and its shadow is $1 : \sqrt{3}$. Then the angle of elevation of the sun is…………
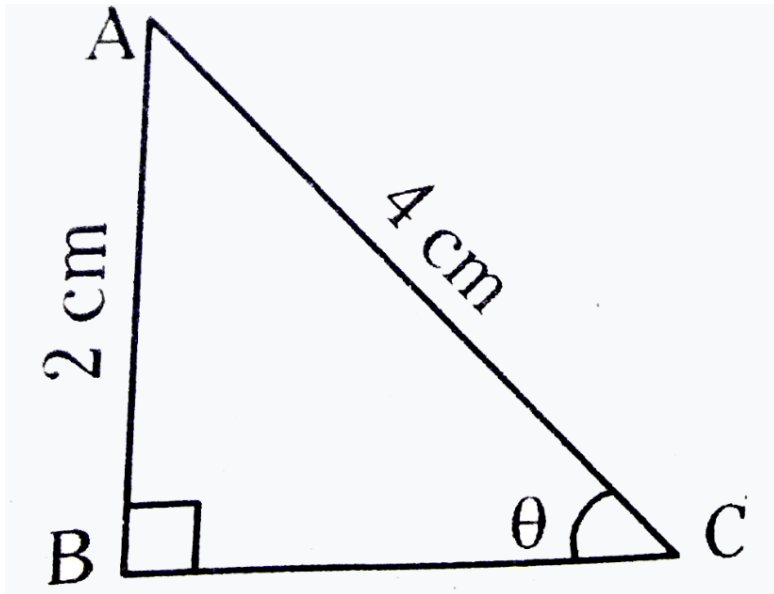
A. 45°

B. 30°

C. 75°

D. 90°

Answer: B

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2. The angle $'\theta'$ in the figure=............

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer: A

3. Angle made by the minutes -hand in a clock during a period of 20 minutes is...........

A. 120°

B. 20°

C. 360°

D. 90°

Answer: A

4. Observe the figure. Length of the ladder

=............
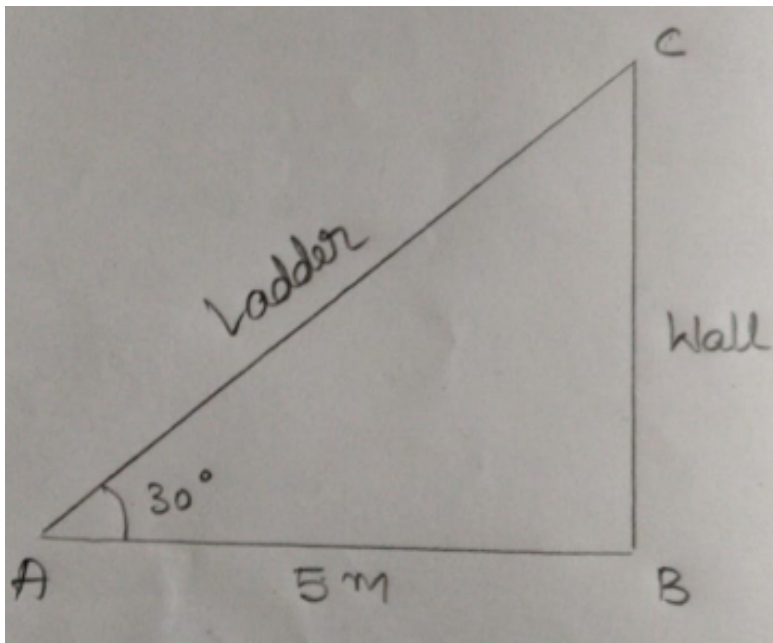
A. 5.78 m

B. 10m

C. 20m

D. 2.5m

Answer: A

5. If the angle of elevation of Sun is $45°$, then the length of the shadow of a 12 m hihgh tree is..........

A. $12\sqrt{3}$m

B. 16m

C. 12m

D. $\dfrac{12}{\sqrt{3}}$m

Answer: C

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6. In the given figure, BC=...........units.
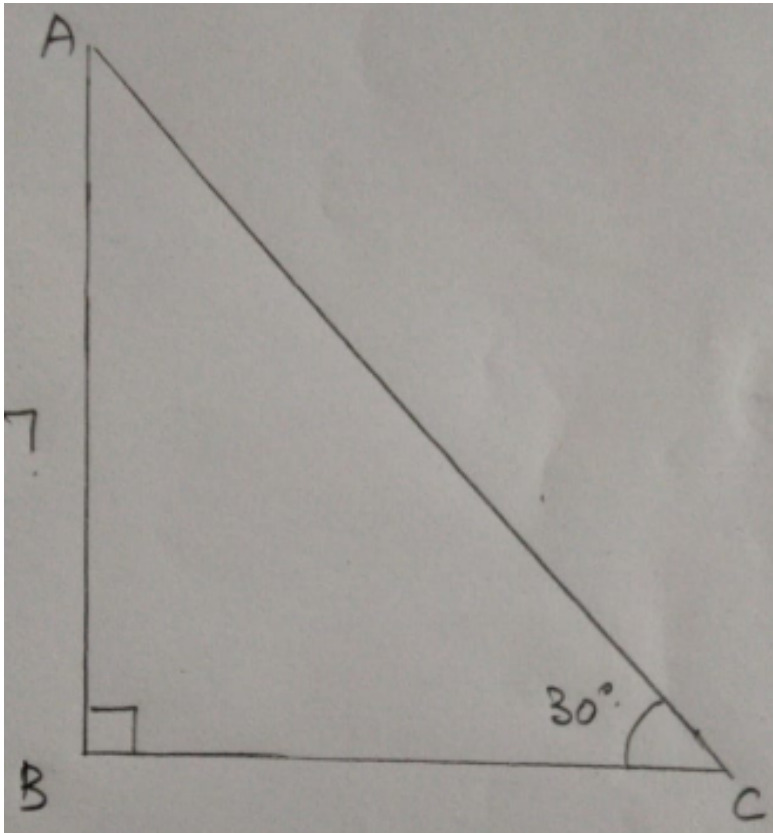
A. $7\sqrt{3}$

B. $7\sqrt{2}$

C. 7

D. 5

Answer: A

7. A boy observed 20 m away from the base of

a 20 m high pole, the angle of elevation of the

top is...............

A. $15°$

B. $30°$

C. $45°$

D. $60°$

Answer: C

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8. The length of shadow of a pole is equal to the length of the pole, then the angle of the elevation of the Sun is ....

A. 15°

B. 30°

C. 45°

D. 60°

Answer: C

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9. Ladder 'x' meters long is laid against a well making an angle $'\theta'$ with the ground. If we want to directly find the distance between the

foot of ladder and foot of the wall, which trigonometrical ratio should be considered?

A. $\sin\theta$

B. $\cos\theta$

C. $\tan\theta$

D. $\cot\theta$

Answer: B

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10. Top of a building was observed at an angle of elevation α from a point. Which is at distance 'd' meters from the foot of the building. Which trigonometrical ratio should be considered for finding height of buildings?

   A. $\tan \alpha$

   B. $\sin \alpha$

   C. $\cos \alpha$

   D. $\sec \alpha$

Answer: A

11. If the angle of elevation of sun increases from $0°$ to $90°$, then the length of shadow of the tower............

    A. no change

    B. increases

    C. decreases

    D. can't be decided

Answer: C

12. The angle of depression from the top of a tower 12m height, at a point on the ground is $30°$. The distance of the point from the tower is................

A. 10m

B. $12\sqrt{3}m$

C. 7.5m

D. 6m

Answer: B

13. A ladder touches a wall at a height of 5m. The angle made by the ladder with the ground, if its length is 10m, will be.............

A. $30°$

B. $60°$

C. $45°$

D. $90°$

Answer: A

Model Examination

1. The length of the shadow of a tree is 8 m long when the sun's angle of elevation is $45°$ is.............m.

A. $\dfrac{8}{\sqrt{3}}$

B. $8\sqrt{3}$

C. 8

D. $16\sqrt{3}$

Answer: C

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2. If a pole 6 m high casts a shadow $2\sqrt{3}$m long on the ground. Then the sun's angle of elevation is

A. $60°$

B. $45°$

C. $30°$

D. $90°$

Answer: A

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3. If the angle of elevation of a tower from a distance of 100 m from its foot is $60°$. Then the height of the tower is ....m.

A. $100\sqrt{3}$

B. $\dfrac{100}{\sqrt{3}}$

C. $50\sqrt{3}$

D. $\dfrac{50}{\sqrt{3}}$

Answer: A

4. The height of a tower is 10m. The length of its shadow when sun's altitude is $45°$ is..........m.

A. 10

B. 20

C. $10\sqrt{3}$

D. 50

Answer: A

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

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer: A

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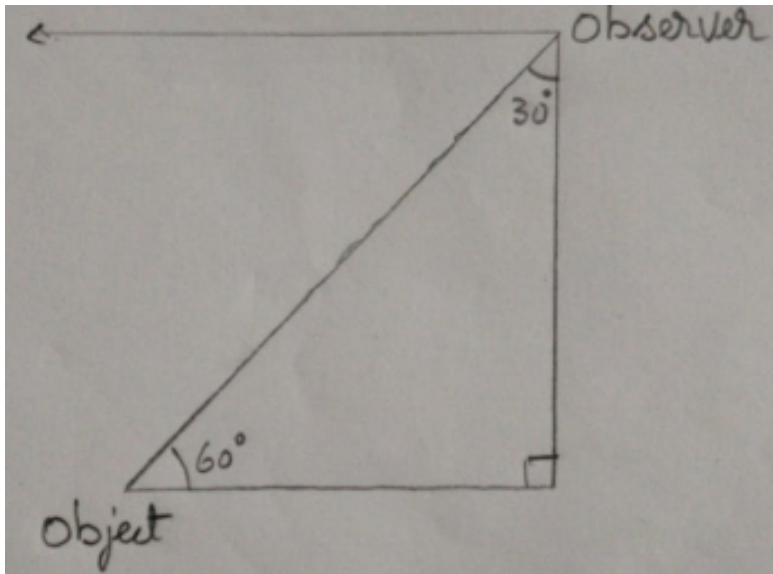**6.** In the given figure, the position of the observer and the object are marked, the angle

of depression is

A. 45°

B. 60°

C. 30°

D. 90°

Answer: B

7. In the given, the value of angle θ is

A. $30°$
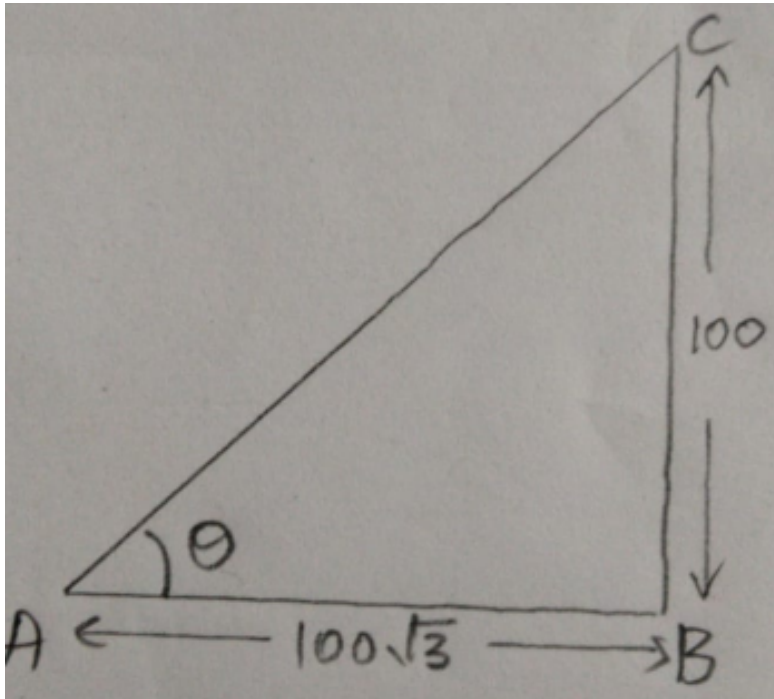
B. $60°$

C. $45°$

D. $90°$

Answer: A

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

A. $45°$

B. $30°$

C. $75°$

D. $90°$

Answer: B

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9. If two towers of height X and Y subtend angles of $30°$ and $60°$ respectively at the

centre of the line joining their feet, then X:Y is equal to

A. $1:3$

B. $3:1$

C. $1:\sqrt{3}$

D. $\sqrt{3}:1$

Answer: A

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10. A wall of 8m long casts a shadow 5m long. At the same time, a tower casts a shadow 50m long. Then the height of tower is

A. 20m

B. 80m

C. 40m

D. 200m

Answer: B

11. If the sun's angle of elevation is $60°$. Then a pole of height 6m will cast a shadow of length……….m.

A. $\sqrt{3}$

B. $5\sqrt{3}$

C. $6\sqrt{3}$

D. $2\sqrt{3}$

Answer: D

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12. A pole of 12m high casts a shadow $4\sqrt{3}$m on the ground. Then the sun's angle of elevation is

A. 60°

B. 120°

C. 45°

D. 30°

Answer: A

13. If the height and length of the shadow of a man are the same, then the angle of elevation of the sun is

    A. $60°$

    B. $45°$

    C. $90°$

    D. $120°$

Answer: B

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14. The given figure shows the observation of point 'C' from point A. The angle of depression from A is
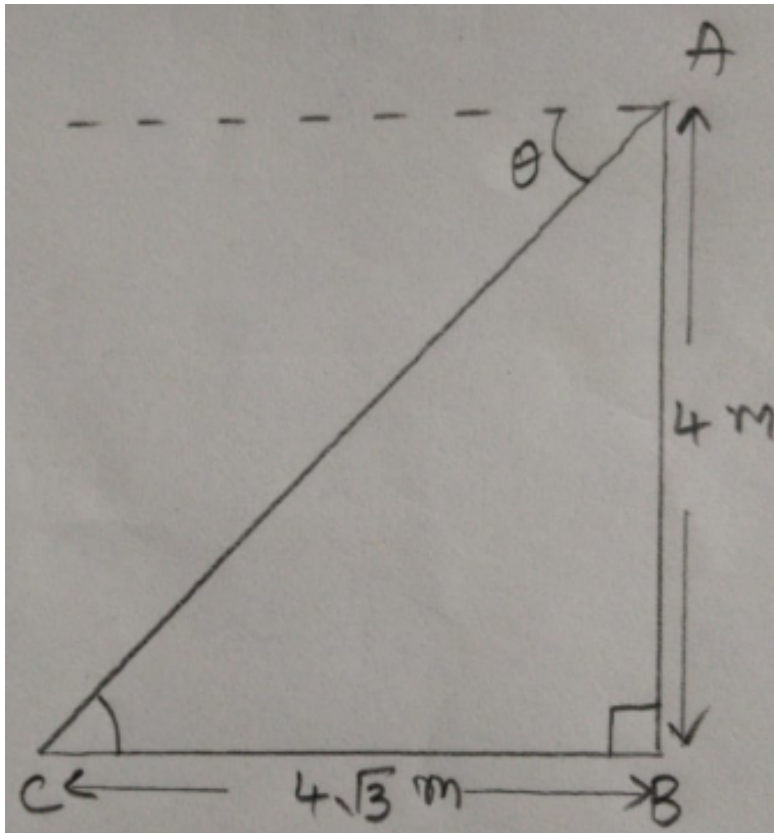
A. 30°

B. 45°

C. 90°

D. 75°

Answer: A

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15. If the length of the shadow of a tower is $\dfrac{1}{\sqrt{3}}$ times the height of the tower, then the angle of elevation of the sun is..........

A. $30°$

B. $45°$

C. $60°$

D. $75°$

Answer: C

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16. A tower is 50m high. Its shadow is x m shorter when the sun's altitude is $45°$ then when it is $30°$, then x=..........m.

A. 105

B. 20

C. 10

D. 37

Answer: D

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17. The length of the string of a kitef flying at 100m above the ground with the elevation of $60°$ is............

A. $\dfrac{200}{\sqrt{3}}$

B. $\dfrac{20}{\sqrt{3}}$

C. $\dfrac{291}{\sqrt{3}}$

D. None

Answer: A

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18. A player sitting on the top of a tower of height 40m observes the angle of depression of a ball lying on the ground is $60°$. The

distance between the foot of the tower and

ball is............m.

A. 20

B. $\dfrac{80}{\sqrt{61}}$

C. $\dfrac{40}{\sqrt{3}}$

D. $\dfrac{40}{\sqrt{6}}$

Answer: C

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19. If the ratio of height of a tower and the length of its shadow on the ground is $\sqrt{3}:1$, then the angle of elevation of the sun is............

A. $80°$

B. $60°$

C. $70°$

D. $100°$

Answer: B

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20. The angle of depression from the top of a tower 100m height, at a point on the ground is $45°$,. The distance of the point from the tower is...............

21. An object is placed above the observer's horizontal, we call the angle between the line of sight and observer's horizontal is..........

A. angle of elevation

B. angle of depression

C. point

D. None

Answer: A

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22. Angle of elevation of the top of a building from a point on the ground is $30°$, Then the angle of depression of this point from the top of the building is.............

A. $65°$

B. $60°$

C. $70°$

D. $30°$

Answer: D

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23. What change will be observed in the angle of elevation as we move away from the object?

A. increase

B. decrease

C. can't be determined

D. None

Answer: B

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24. An objcet is placed below the observer's horizontal, then what is the angle between line of sight and observer's horizontal ?

A. angle of elevation

B. angle of depression

C. can't be determined

D. None

Answer: B

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25. What change will be observed in the angle of elevation as we approach the foot of the tower?

A. 0

B. $60°$

C. Data not correct

D. decrease

Answer: D

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26. In the figure given below, the imaginary line through the object and eye of the

observer is called...........

A. line of sight

B. angle of depression

C. angle of elevation

D. None

Answer: A

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27. In the figure given below, a man on the top of cliff observers a boat coming towards him. Then θ represents the angle of...............
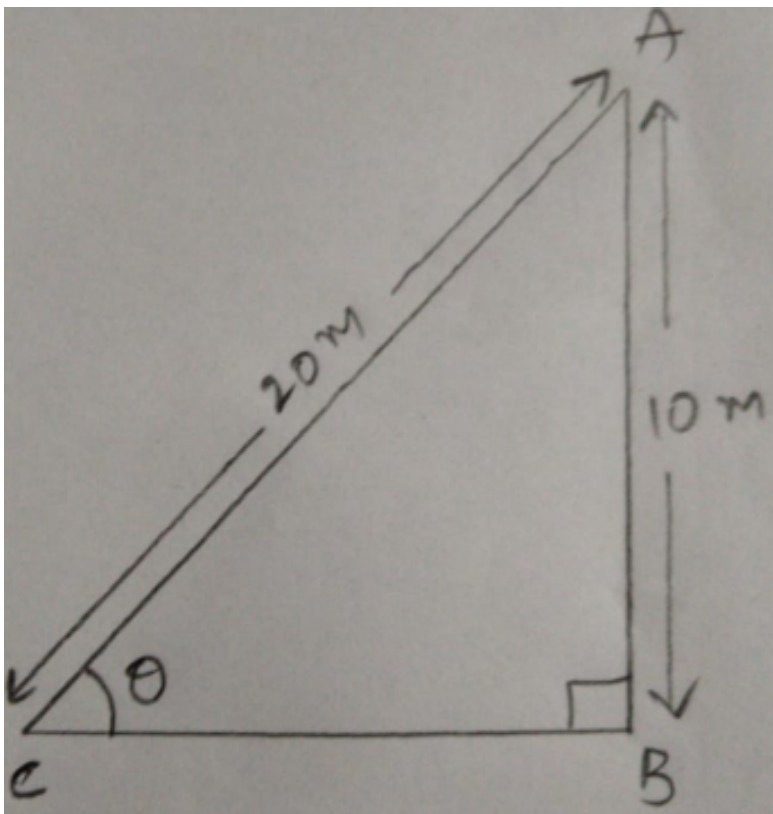

    A. depression

    B. elevation

    C. equal

    D. None

Answer: A

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28. In the figure given below, if AB=10m and AC=20m, then θ =.................

A. $60°$

B. $30°$

C. $70°$

D. None

Answer: B

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29. If a pole height 6m casts a shadow $2\sqrt{3}$m long on the ground, then the sun's elevation is

A. $70°$

B. $20°$

C. $80°$

D. $60°$

Answer: D

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30. In figure given below, if AB=CD=$10\sqrt{3}$ m then BC=............m.
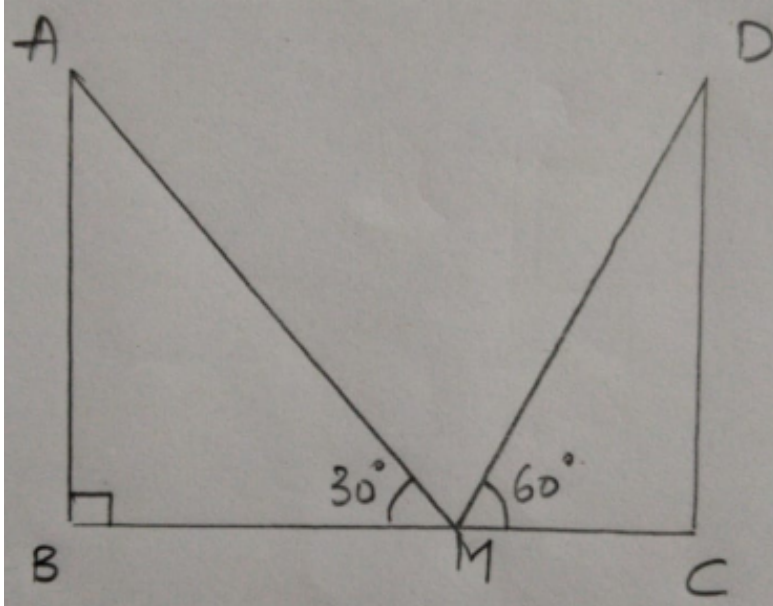
A. 90

B. 60

C. 40

D. None

Answer: C

31. In the figure given below, if AB=$10\sqrt{3}$m, then CD=..........
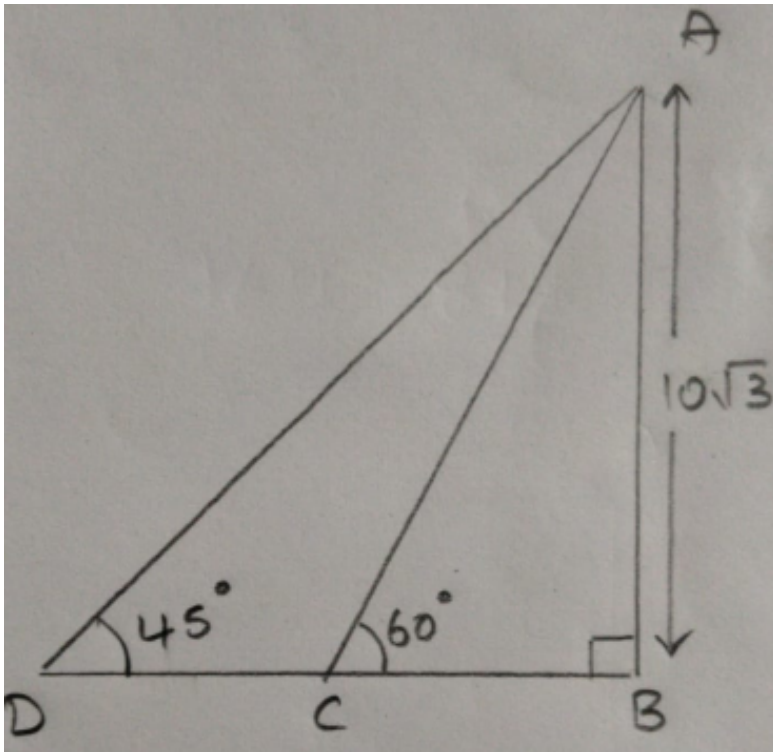
A. 7.32

B. 8.14

C. 3.1

D. 1.92

Answer: A

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32. In the figure given below, if AD=$7\sqrt{3}$m, then BC=.........m.
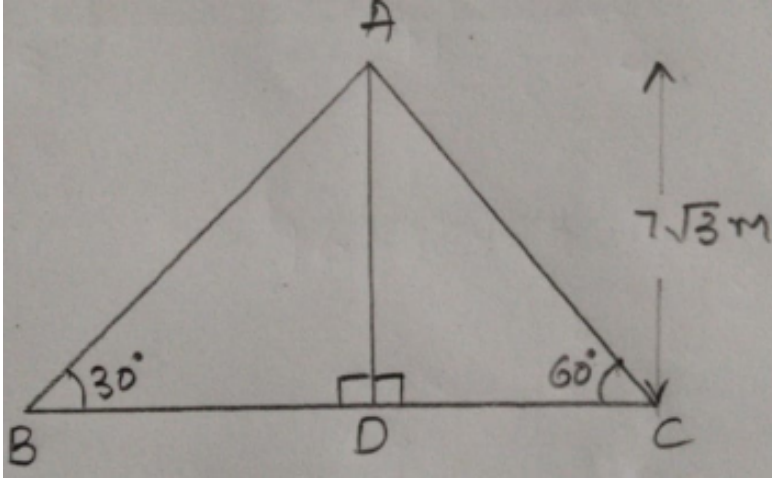
A. 13

B. 19

C. 28

D. None

Answer: C

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33. The length of the shadow of a tree is 7m and height is 7m, when the sun's elevation is.............

A. $45°$

B. $60°$

C. $70°$

D. $90°$

Answer: A

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34. If two tangents inclined at an angle of $60°$ are drawn to a circle of radius 3 cm, then length of tangents is equal to............m.

A. $4\sqrt{3}$

B. $2\sqrt{91}$

C. $\sqrt{3}$

D. $3\sqrt{3}$

Answer: D

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

A. angle of elevation

B. angle of depression

C. equal angle

D. None

Answer: A

36. $\cot^2 B - \cos ec^2 B$=.............

A. 0

B. -1

C. 1

D. 2

Answer: B

37. $\dfrac{\tan \theta}{\sec \theta} =$................

A. $- \cos \theta$

B. $\sin \theta$

C. $- \tan \theta$

D. None

Answer: B

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38. A boy observed the top of an electrical pole to be at angle of elevation of $60°$ when the observation point is 8m away from the foot of the pole then the height of the pole is..........m.

A. $18\sqrt{3}$

B. 14

C. $7\sqrt{3}$

D. $8\sqrt{3}$

Answer: D

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39. Suppose you are shooting an arrow from the top of a building at a height of 6 m to a target on the ground at an angle of depression of $60°$. What is the distance between you and the object ?

A. 9

B. $7\sqrt{3}$

C. $12\sqrt{3}$

D. None

Answer: D

40. $\sin \dfrac{\pi^e}{2} = \text{............}$

A. 4

B. 3

C. 1

D. -1

Answer: C

41. Domain of $\sin\theta$=.............

A. R

B. $R - \{30°\}$

C. N

D. None

Answer: A

42. $\tan \dfrac{\pi^e}{4} =$............

A. 2

B. 3

C. -1

D. 1

Answer: D

43. $\cot 15^\circ =$ ....

A. $2 + \sqrt{3}$

B. $2 - \sqrt{3}$

C. $\sqrt{2}$

D. $\sqrt{3} - 1$

Answer: A

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44. $A + B = 180°$ then $\cos A + \cos B$=...........

A. 4

B. 1

C. 0

D. None

Answer: C

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45. $\sin 15^\circ = \dots\dots\dots$

A. $\dfrac{\sqrt{3}}{9\sqrt{2}}$

B. $\dfrac{\sqrt{3}-1}{2\sqrt{2}}$

C. $\dfrac{\sqrt{3}+1}{2}$

D. None

Answer: B

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46.

$$\tan A = \frac{n}{n + 1}, \tan B = \frac{1}{2n + 1}, \tan(A + B)$$

=..........

    A. 4

    B. 3

    C. -1

    D. 1

Answer: D

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47. The angle of elevation of tower at a point 40m apart form it is $\cot^{-1}\left(\dfrac{3}{5}\right)$. Obtain the height of the tower.

A. $\dfrac{200}{3}$ m

B. $\dfrac{100}{3}$ m

C. $\dfrac{210}{17}$ m

D. None

Answer: A

48. A ladder 20m long is placed against a vertical wall of height 10m, then the distance between the foot of the ladders and wll is........... m.

A. $7\sqrt{3}$

B. $20\sqrt{3}$

C. $10\sqrt{3}$

D. None

Answer: C

49. $\sin 18° =$............

A. $\dfrac{\sqrt{5}}{4}$

B. $\dfrac{\sqrt{5}-1}{4}$

C. $\dfrac{1+\sqrt{3}}{2}$

D. $\dfrac{\sqrt{3}-1}{4}$

Answer: B

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50. In the below figure x=......
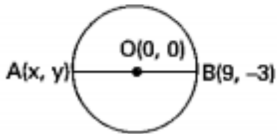
A. 10

B. 12

C. 13

D. 19

Answer: A

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51. $\cot(90 - A) = $ ....

A. 3 tan A

B. sin A

C. cot A

D. tan A

Answer: D

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52. $\cos^4 A - \sin^4 A =$ ....

A. $\sin^2 A$

B. $\cos^2 A$

C. $\cos 2A$

D. $\cos 3A$

Answer: C

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53. If $\cos ec\theta + \cot \theta = k$ then $\cos \theta$=.............

A. $\dfrac{k^2 - 1}{k^2 + 1}$

B. $\dfrac{k^2}{k^2 - 1}$

C. $\dfrac{k^2 + 1}{k}$

D. None

Answer: A

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54. $x = (\sec\theta + \tan\theta), y = (\sec\theta - \tan\theta)$

then xy=............

A. -1

B. 0

C. 1

D. -2

Answer: C

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55. $\tan 15^\circ$ =.............

A. $\dfrac{\sqrt{3}}{\sqrt{3}+1}$

B. $\dfrac{\sqrt{3}-1}{\sqrt{3}+1}$

C. $\dfrac{\sqrt{3}-1}{2}$

D. None

Answer: B

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56. $\cos ec\theta$=...........

A. $\sqrt{1+\cot^2\theta}$

B. $\sqrt{\cot^2\theta-1}$

C. $\sqrt{1+\sin\theta}$

D. $\sqrt{\cot\theta - 1}$

Answer: A

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57. $x = a\sin\theta,\ y = a\cos\theta$ then $x^2 + y^2$

=............

A. $\dfrac{a}{3}$

B. $\dfrac{a}{2}$

C. a

D. a^2

Answer: D

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58. Example of a Pythagorean Triplet is............

A. 5,12,13

B. 5,10,11

C. 8,9,11

D. None

Answer: A

---

59. $\sec^2 A$=..............

    A. $1 - \tan^2 A$

    B. $1 + \tan^2 A$

    C. $\cot^2 A$

    D. None

Answer: B

60. $\dfrac{1}{\cos\theta} - \cos\theta = \text{............}$

A. $\tan\theta,\ \sin\theta$

B. $\sec\theta,\ \cos\theta$

C. $\tan\theta,\ \cot\theta$

D. None

Answer: A

61. $\sin \theta = \cos \theta, \theta \in Q_1$ then θ-

A. $\dfrac{\pi^e}{2}$

B. $\dfrac{\pi^e}{3}$

C. $\dfrac{2\pi^e}{4}$

D. $\dfrac{\pi^e}{4}$

Answer: D

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62. $72^\circ =$..............

A. $\dfrac{\pi^e}{2}$

B. $\dfrac{\pi^e}{3}$

C. $\dfrac{2\pi^e}{5}$

D. $\dfrac{\pi^e}{5}$

Answer: C

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63. $\sin^2 105° + \cos^2 105° = $..............

A. 1

B. 0

C. 9

D. 10

Answer: A

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64. $\sin 45° \left(\cos 45°\right)$=..............

A. 1

B. $\dfrac{1}{2}$

C. 3

D. None

Answer: B

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65. $\cos 40° = 0.76$ then $\sin 50°$ =.............

A. 0.76

B. 7.6

C. 76.6

D. None

Answer: A

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66. At a point 15m away form the base of a 15m high pole, the angle of elevation of the top is..........

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer: B

67. The length of shadow of a pole is equal to the length of the pole, then the angle of the elevation of the Sun is ....

A. $15°$

B. $30°$

C. $45°$

D. $60°$

Answer: C

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68. The angle of elevation of top of a tree is $30°$. On moving 20m nearer, the angle of elevation is $60°$. The height of the tree is

A. $15\sqrt{3}$ m

B. $2\sqrt{3}$ m

C. $10\sqrt{3}$ m

D. $5\sqrt{3}$ m

Answer: C

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69. The ratio of length of a pole and its shadow is $1 : \sqrt{3}$. The angle of elevation is

    A. $90°$

    B. $60°$

    C. $45°$

    D. $30°$

Answer: D

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70. The upper part of a tree is broken by wind and makes an angle of $30°$ with the ground and at a distance of 21m from the foot of the tree. Find the total height of the tree.

A. $30\sqrt{3}$ m

B. 30 m

C. 21 m

D. $21\sqrt{3}$ m

Answer: D

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71. From a bridge 25m high, the angle of depression of a boat is $45°$. Find the horizontal distance of the boat from the bridges.

A. $25\sqrt{3}m$

B. 25m

C. $\dfrac{25}{\sqrt{3}}m$

D. 45m

Answer: B

72. A tower makes an angle of elevation equal to the angle of depression from the top of a cliff 25m height. Find the heigh of the tower.

A. 25m

B. 75m

C. 5m

D. 50m

Answer: D

73. When the angle of elevation of a pole is $45°$, the length of the pole and its shadow are

    A. equal

    B. length $>$ shadow

    C. shadow $>$ length

    D. None

Answer: A

74. In a rectangle, if the angle between a diagonal and a side is $30°$, and the length of the diagonal is 6 cm, the area of the rectangle is

A. $18 cm^2$

B. $9 cm^2$

C. $18\sqrt{3} cm^2$

D. $9\sqrt{3} cm^2$

Answer: D

75. Two posts are 15 m and 25m high and the line joining their tope make an angle of $45°$ with the horizontal, the distance between the two posts is

    A. 15m

    B. 25m

    C. 18m

D. 10m

Answer: D

76. An electric pole 20m high stands up right on the ground with the help of steel wire to its top and affixed on the ground. If the steel wire makes $60°$ with the horizontal ground, find the length of steel wire.

A. $60\sqrt{3}$m

B. 20m

C. 60m

D. $\dfrac{40}{\sqrt{3}}$m

Answer: D

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77. A building casts a shadow of length $50\sqrt{3}$ m when the sun is $30°$ about the horizontal. The height of the building is

A. 30m

B. 40m

C. 50m

D. 60m

Answer: C

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78. When the angle of elevation of a light changes from $30°$ to $45°$, the shadow of

pole becomes $100\sqrt{3}$ m less. The height of the pole is

A. 30m

B. 120m

C. 75m

D. 236 m

Answer: D

79. From the top of a building 50m from horizontal, the angle of depression made by a car is $30°$. How far is the car from the building?

A. $\dfrac{50}{\sqrt{3}}$m

B. $50\sqrt{3}$m

C. 150m

D. $30\sqrt{3}$m

Answer: B

80. From the top of a building with height $30(\sqrt{3}+1)$ m two cars make angle of depression of $45°$ and $30°$ due east. What is the distance between two cars?

A. 30m

B. 60m

C. 45m

D. 75m

Answer: B

81. A person standing on the bank of a river observes that the angle subtended by a tree on the opposite bank is $60°$. When he retires 40m from the bank, he finds the angle to be $30°$. The breadth of the river is

A. 10m

B. 15m

C. 20m

D. 25m

Answer: C

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82. A ladder touches a wall at a height of 5m. The angle made by the ladder with the ground, if its length is 10m, will be..............

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer: A

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83. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground by making $30°$ angle with the ground. The distance between the top of the

tree and the ground is 10m. Find the height of the tree.

A. 10m

B. $30\sqrt{3}$m

C. $10\sqrt{3}$m

D. 30m

Answer: C

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84. If the angle of elevation of a cloud from a point 200 m above a lake is $30o$ and the angle of depression of its reflection in the lake is $60o$, then the height of the cloud above the lake, is (a) 200 m (b) 500 m (c) 30 m (d) 400 m

    A. 100m

    B. 200m

    C. 300m

    D. 400m

Answer: D

85. An aeroplane flying horizontally 1 km above the ground is observed at an elevation of $60°$. After a flight of 10 seconds, its angle of elevation is observed to be $30°$ from the same point on the ground. Find the speed of the aeroplane.

    A. 415.7 km/h

    B. 215.3 km/h

    C. 700 km/h

D. None

Answer: A

---

86. If AB=4m, and AC=8m, then the angle of elevation of A as observed from C is

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer: A

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87. If a pole height 6m casts a shadow $2\sqrt{3}m$ long on the ground, then the sun's elevation is

A. $30°$

B. $60°$

C. $45°$

D. $90°$

Answer: B

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88. The length of shadow of a pole is equal to the length of the pole, then the angle of the elevation of the Sun is ....

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer: B

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89. If the shadow of a tree is $\dfrac{1}{\sqrt{3}}$ times the height of the tree, then the angle of elevation of the sun is

A. $30°$

B. $45°$

C. $60°$

D. $60°$

Answer: C

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Exercise

1. Draw diagram for the following situtions :

A person is flying a kite at an angle of

elevation α and the length of thread from his hand to kite is 'l'.

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2. Draw diagram for the following situions :

A person observes two banks of a river at angles of depression θ_1 and $\theta_2(\theta_1 < \theta_2)$ from the top of a tree of height 'h' which is at a side of the river. The width of the river is 'd'.

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3. The top of a clock tower is observed at angle of elevation of $\alpha°$ and the foot of the tower is at the distance of d meters from the observer. Draw the diagram for this data.

4. Rinky observes a flower on the ground from the balcony of the first floor of a building at an angle of depression $\beta°$. The height of the first floor of the building is x meters. Draw the diagram for this data.

5. A ladder of length x meter is leaning against a wall making angle θ with the ground. Which trigonometric ratio would you like to consider to find the height of the point on the wall at which the ladder is touching?

6. A large balloon has been tied with a rope and it is floating in the air. A person has observed the balloon from the top of a building at angle of elevation of θ_1 and foot of the rope at an angle of depression of θ_2. The height of the building is h feet. Draw the diagram for this data.

7. A boy observed the top of an electric pole at an angle of elevation of $60°$ when the observation point is 8 meters away from the foot of the pole. Find the height of the pole.

8. Rajender observes a person standing on the ground from a helicopter at an angle of depression $45°$. If the helicopter flies at a

height of 500 meters from the ground, what is the distance of the person from Rajender?

9. A tower stands vertically on the ground. From a point which is 15 meter away from the foot of the tower, the angle of elevation of the top of the tower is $45°$. What is the height of the tower?

10. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground by making $30°$ angle with the ground. The distance between the foot of the tree and the top of the tree on the ground is 6 m. Find the height of the tree before falling down.

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11. A contractor wants to set up a slide for the children to play in the park. Hed wants to set it

up at the height of 2m and by making an angle of $30°$ with the ground. What should be the length of the slide?

12. Length of the shadow of a 15 meter high pole is $5\sqrt{3}$ meters at 7 o'clock in the morning. Then, what is the angle of elevation of the Sun rays with the ground at the time?

13. You want to erect a pole of height 10 m with the support of three ropes. Each rope has to make an angle $30°$ with the pole. What should be the length of the rope?

14. Suppose you are shooting an arrow from the top of a building at a height of 6 m to a target on the ground at an angle of depression of $60°$. What is the distance between you and the object ?

15. An electrician wants to repair an electric connection on a pole of height 9m. He needs to reach 1.8 m below the top of the pole to do repair work. What should be the length of the ladder which he should use, when he climbs it at an angle of $60°$ with the ground? What will be the distance between foot of the ladder and foot of the pole?

16. A boat had to cross a river. It crosses the river by making an angle of $60°$ with the bank of the river due to the stream of the river and travel a distance of 600 m to reach the another side of the river. What is the width of the river ?

17. An observer of height 1.8 m is 13.2 m away from a palm tree. The angle of elevation of the

top of the tree from his eyes is $45°$. What is the height of the palm tree ?

18. In the given figure, AC= 6 cm, AB= 5 cm and $\angle BAC = 30°$. Find the area of the triangle.

19. Two men on either side of a temple of 30 meter height observe its top at the angles of

elevation $30°$ and $60°$ respectively. Find the distance between the two men.

20. A straight highway leads to the foot of a tower. Ramaiah standing at the top of the tower observe a car at an angle of depression $30°$. The car is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to

be $60°$. Find the time taken by the car to reach the foot of the tower from this point.

21. A TV tower stands vertically on the side of a road. From a point on the other side directly opposite to the tower, the angle of elevation of the top of tower is $60°$. From another point 10 m away from this point, on the line joining this point to the foot of the tower, the angle of elevation of the top of the tower is $30°$.

Find the height of the tower and the width of the road.

22. A 1.5 m tall boy is looking at the top of a temple which is 30 m in height from a poin at certain distance. The angle of elevation from his eye to the top of the crown of the temple increases from $30°$ to $60°$ as he walks towards the temple. Find the distance he walked towards the temple.

23. A statue stands on the top of a 2m tall pedestal. From a point on the ground, the angle of elevation of the top of the statue is $60°$ and from the same point the angle of elevation of the top of the pedstal is $45°$. Find the height of the statue.

24. From the top of a building, the angle of elevation of the top of a cell tower is $60°$ and the angle of depression to its foot is $45°$. If distance of the building from the tower is 7m, then find the height of the tower.

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25. A wire of length 18m had been tied with electric pole at an angle of elevation $30°$ with the ground. As it is covering a long distance, it

was cut and tied at an angle of elevation $60°$ with the ground. How much length of the wire was cut?

26. 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 $60°$. If the tower is 30m high, find the height of the building.

27. Two poles of equal height are standing opposite to each other on either sidef of the road, which is 120 feet wide. From a point between then on the road, the angles of elevation of the top of the poles are $60°$ and $30°$ respectively. Find the height of the poles and the distances of the point from the poles.

28. The angle of the elevation of the top of a tower from two points at a distance of 4m and 9m from the base of the tower and in the same straight line with it, are complementary. Prove that the height of the tower is 6m.

29. The angle of elevation of a jet plane from a point A on the ground is $60°$. After a flight of 15 seconds, the angle of elevation changes to $30°$. If the jet plane is flying at a constant

height of $1500\sqrt{3}$ m, find the speed ot the jet plane.

30. The angle of elevation of the top of a tower from the foot of the building is $30°$ and the angle of elevation of fhe top of the building from the foot of the tower is $60°$. What is the ratio of heights of tower and building?

31. A 1.2m 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 sometimes, the angle of elevation reduces to $30°$. Find the distance travalled by the balloon during the interval.

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32. The angles of elevation of the top of a lighthouse from 3 boats A,B and C in a straight line of same side of the lighthouse are a,2a,3a respectively. If the distance between the boats A and B is x meters. Find the height of lighthouse.

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33. Inner part of a cupboard is in the cuboidical shape with its length, breadth and

height in the ratio $1:\sqrt{2}:1$. What is the angle made by the longest stick which can be inserted cupboard with its base inside?

34. An iron spherical ball of volume 232848 cm^3 has been melted and converted into a cone wih the vertical angle of $120°$. What are its height and base?

35. Show that the area of an Isosceles triangles is $A = a^2 \sin\theta \cos\theta$ where a is the length of one of the two equal sides and θ is the measure of one of two equal angles.

36. A right circular cylindrical tower, height 'h' and radius 'r', stands on the ground. Let 'P' be a point in the horizontal plane ground and ABC be the semi-circular edge of the top of the tower such that B is the point in it nearest to

P. The angles of elevation of the points A and B are $45°$ and $60°$ respectively. Show that $\dfrac{h}{r} = \dfrac{\sqrt{3}\left(1 + \sqrt{3}\right)}{2}$.

37. A person from the top of a building of height 25 m has observed another building top and bottm at an angle of elevation $45°$ and at an angle of depression $60°$ respectively. Draw the diagram for this data.

38. A person observed the top of a tree at an angle of elevation of $60°$ when the observation point was 5m away from the foot of the tree. Draw a diagram for this data.

39. If the angle of elevation of sun increases from '0' to 90 then the length of shadow of a

tower decreases. Is this true? Justify your answer.

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40. If a tower of height 'h' is observed from a point with a distance 'd' and angle 'θ' , then express the relation among h,d, θ.

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41. A pole and its shadow have same length, find the angle of the sun ray made with the earth at that time.

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42. A ladder of 3.9 m length is laid against a wall. The distance between the foot of the wall and the ladder is 1.5 m. Find the height at which the ladder touches the wall.

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43. A boat has to cross a river. It crosses river by making an angle of $60°$ with bank, due to the stream of river it travels a distance of 450m to reach another side of river. Draw a diagram to this data.

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44. A person 25 m away from a cell tower observes the top of cell tower at an angle of

elevation $30°$. Draw the suitable diagram for this situation.

45. A straight highway leads to foot of the tower. A man standing at the top of the tower observes a car at an angle of depression of θ, which is approaching the foot of the tower with a uniform speed. Six seconds later the angle of depression is ϕ. Draw a diagram for this data and analyze.

46. From the top of a tower of h m height, Anusha observes the anges of depression of two points X and Y on the same side of tower on the ground to be α and β. Draw the suitable figure for the given information.

47. From the top of a building, the angle of elevation of the top of a cell tower is $60°$ and

the angle of depression to its foot is $45°$. If distance of the building from the tower is 7m, then find the height of the tower.

48. From the top of the building, the angle of elevation of the top of a. T.V tower is $\alpha°$ and the angle of depression to its (T.V tower) foot is $\beta°$. If distance of the building from the tower is 'd' meters, draw the suitable diagram to the given data.

49. The angle of elevation of the top of a tower from a point on the ground, which is 50 m away from the foot of the tower is $45°$. Draw the diagram for the situation.

50. An observer flying in an aeroplane at an altitude of 900 m observes two ships in front of him, which are in the same direction at an

angles of depression of $60°$ and $30°$ respectively. Find the distance between the two ships.

51. A person from the top of a building height 15 m observes the top and the bottem of a cell tower with the angle of elevation as $60°$ and the angle of depression as $45°$ respectively. Then find the height of the that cell tower.

52. Two poles of equal height are standing opposite to each other on either side of the road, which is 80 m wide. From a point between then on the road, the angles of elevation of top of the poles are $60°$ and $30°$. Find the height of poles.

53. A tree is breaken without separating from the stem by the wind. The top touches the

ground making an angle $30°$ at a distance of 12m from the foot of the tree. Find the height of the tree before breaking.

54. Two poles are standing opposite to each other on either sidef of the road which is 90 feet wide.The angle of elevation from bottom of first pole to top of second pole is $45°$, the angle of elevation from bottom of second pole

to top of first pole is $30°$. Find the heights of poles.

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55. The angle of the elevation of the top of a tower from two points at a distance of 4m and 9m from the base of the tower and in the same straight line with it, are complementary. Prove that the height of the tower is 6m.

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56. From the top of a tower of 50m high, Neha observes the angles of depression of the top and foot of another building to be $45°$ and $60°$ respectively. Find the height of the building.

57. 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. Find the height of the hill.

58. Two men on either side of a temple of 30 meter height observe its top at the angles of elevation $30°$ and $60°$ respectively. Find the distance between the two men.

59. A man observes top of a tower at an angle of elevation of $30°$. When he walked 40 m towards the tower, the angle of elevation is changed to $60°$ Find the height of the tower and distance from the first observation point to the tower.

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60. A flag pole 4 cm tall casts a 6m, shadow. At the same time , a nearby building casts a

shadow of 24 m. How tall is the building?

61. A pole is arranged from a height of 30m from the ground, making $60°$ angle with earth. Then what is its length?

62. A long pole is broken in a storm. Top end of the broken pole touched the head of a man at

a distance of 'd'. Then find the angle between the man and the pole that before storm.

63. A kite is flown from a building with a height (h) m with a long rope. Now the kite, and the person having it are observed with angles of elevation α and β respectively by a boy. The distance between boy and building is 'x' m. So draw a diagram for this data.

64. A person observes tops of two buildings with an angle of elevations $35°$ and $46°$ from the mid point in between them. So which building is higher? Why?

65. A 15 m long pole forms $5\sqrt{3}$ m long shadow at 8 AM in the morning. Then find the angle made by sun rays with earth.

66. Ladder 'x' meters long is laid against a well making an angle $'\theta'$ with the ground. If we want to directly find the distance between the foot of ladder and foot of the wall, which trigonometrical ratio should be considered?

A. $\sin\theta$

B. $\cos\theta$

C. $\tan\theta$

D. $\cot\theta$

Answer:

67. Two persons A and B observe the top of a pole at an angle of elevation α and β respectively. If $\alpha > \beta$, then ....

    A. A is nearer to the pole than B.

    B. B is nearer to the pole than A.

    C. A, B are at the same distance from the pole

D. Can't compare their distances.

Answer:

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68. Top of a building was observed at an angle of elevation α from a point. Which is at distance 'd' meters from the foot of the building. Which trigonometrical ratio should be considered for finding height of buildings?

A. $\tan \alpha$

B. $\sin \alpha$

C. $\cos \alpha$

D. $\sec \alpha$

Answer:

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69. If the angle of elevation of sun increases from $0°$ to $90°$, then the length of shadow of the tower............

A. no change

B. increases

C. decreases

D. can't be decided

Answer:

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70. The angle of depression from the top of a tower 12m height, at a point on the ground is

$30°$. The distance of the point from the top

is................

A. 10 m

B. $12\sqrt{3}m$

C. 7.5 m

D. 6 m

Answer:

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71. A ladder touches a wall at a height of 5m. The angle made by the ladder with the ground, if its length is 10m, will be.............

A. $30°$

B. $60°$

C. $45°$

D. $90°$

Answer:

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72. A 20 m long ladder is placed on a pole of 10 m height making 'α' angle with the ground, then, α =

A. $60°$

B. $45°$

C. $30°$

D. $0°$

Answer:

▶ Watch Video Solution

73. A ladder 15m long just reaches the top of vertical wall. If the ladder makes an angle of $60°$ with the wall. Then the height of the wall is

A. $15\sqrt{5}m$

B. $\dfrac{15\sqrt{3}}{2}m$

C. 7.5 m

D. 15 m

Answer:

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74. The length of the shadow of a tree is 8 m long when the sun's angle of elevation is $45°$ is...........m.

A. $\dfrac{8}{\sqrt{3}}$

B. $8\sqrt{3}$

C. 8

D. $16\sqrt{3}$

Answer:

75. If a pole 6 m high casts a shadow $2\sqrt{3}$m long on the ground. Then the sun's angle of elevation is

A. $60°$

B. $45°$

C. $30°$

D. $90°$

Answer:

76. If the angle of elevation of a tower from a distance of 100 m from its foot is $60°$. Then the height of the tower is ....m.

    A. $100\sqrt{3}$

    B. $\dfrac{100}{\sqrt{3}}$

    C. $50\sqrt{3}$

    D. $\dfrac{50}{\sqrt{3}}$

Answer:

77. The height of a tower is 10m. The length of its shadow when sun's altitude is $45°$ is..........m.

    A. 10

    B. 20

    C. $10\sqrt{3}$

    D. 50

Answer:

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

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer:

79. In the given figure, the position of the observer and the object are marked, the angle of depression is

A. $45°$
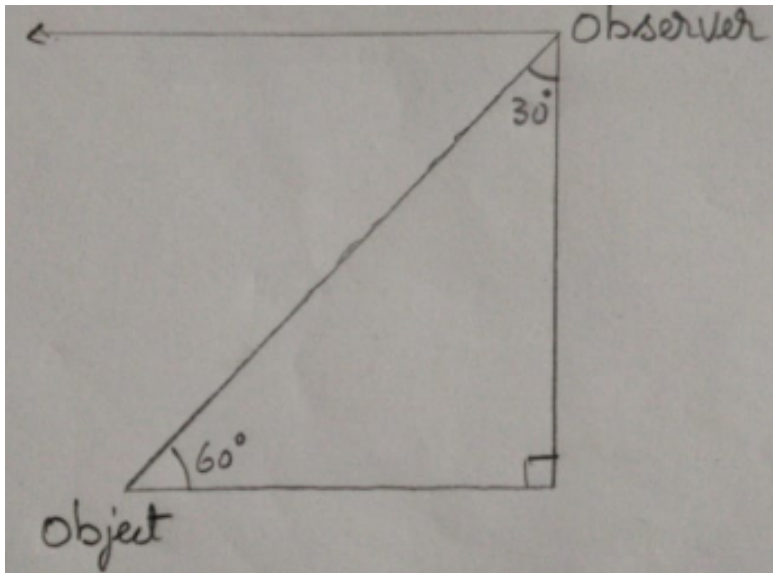
B. $60°$

C. $30°$

D. $90°$

Answer:

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

A. $45°$

B. $30°$

C. $75°$

D. $90°$

Answer:

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81. If two towers of height X and Y subtend angles of $30°$ and $60°$ respectively at the

centre of the line joining their feet, then X:Y is equal to

A. $1 : 3$

B. $3 : 1$

C. $1 : \sqrt{3}$

D. $\sqrt{3} : 1$

Answer:

82. A wall of 8m long casts a shadow 5m long. At the same time, a tower casts a shadow 50m long. Then the height of tower is

A. 20 m

B. 80 m

C. 40 m

D. 200 m

Answer:

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83. If the sun's angle of elevation is $60°$. Then a pole of height 6m will cast a shadow of length..........m.

A. $\sqrt{3}$

B. $5\sqrt{3}$

C. $6\sqrt{3}$

D. $2\sqrt{3}$

Answer:

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84. A pole of 12m high casts a shadow $4\sqrt{3}$m on the ground. Then the sun's angle of elevation is

A. $60°$

B. $120°$

C. $45°$

D. $30°$

Answer:

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85. If the height and length of the shadow of a man are the same, then the angle of elevation of the sun is

A. $60°$

B. $45°$

C. $90°$

D. $120°$

Answer:

▶ Watch Video Solution

86. If the length of the shadow of a tower is $\dfrac{1}{\sqrt{3}}$ times the height of the tower, then the angle of elevation of the sun is..........

    A. 30°

    B. 45°

    C. 60°

    D. 75°

Answer:

87. A tower is 50m high. Its shadow is x m shorter when the sun's altitude is $45°$ then when it is $30°$, then x=..........m.

    A. 105

    B. 20

    C. 10

    D. 100

Answer:

88. The length of the string of a kitef flying at 100m above the ground with the elevation of $60°$ is..............

A. $\dfrac{200}{\sqrt{3}}$

B. $\dfrac{20}{\sqrt{3}}$

C. $\dfrac{291}{\sqrt{3}}$

D. none

Answer:

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89. A player sitting on the top of a tower of height 40m observes the angle of depression of a ball lying on the ground is $60°$. The distance between the foot of the tower and ball is............m.

A. 20

B. $\dfrac{80}{\sqrt{61}}$

C. $\dfrac{40}{\sqrt{3}}$

D. $\dfrac{40}{\sqrt{6}}$

Answer:

90. If the ratio of height of a tower and the length of its shadow on the ground is $\sqrt{3}:1$, then the angle of elevation of the sun is............

A. $80°$

B. $60°$

C. $70°$

D. $100°$

Answer:

91. The angle of depression from the top of a tower 100m height, at a point on the ground is $45°$,. The distance of the point from the tower is...............

A. 18.1

B. 16.3

C. 36.6

D. 26.7

Answer:

92. An object is placed above the observer's horizontal, we call the angle between the line of sight and observer's horizontal is..........

A. angle of, elevation

B. angle of depression

C. point

D. none

Answer:

---

93. Angle of elevation of the top of a building from a point on the ground is $30°$, Then the angle of depression of this point from the top of the building is..............

   A. $65°$

   B. $60°$

   C. $70°$

D. $30°$

Answer:

94. What change will be observed in the angle

of elevation as we move away from the object?

A. increase

B. decrease

C. can't be determined

D. none

Answer:

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95. An objcet is placed below the observer's horizontal, then what is the angle between line of sight and observer's horizontal ?

A. angle of elevation

B. angle of. depression

C. can't be determined

D. none

Answer:

▶ **Watch Video Solution**

96. What change will be observed in the angle of elevation as we approach the foot of the tower?

A. 0

B. $60°$

C. Data not correct

D. none

Answer:

▶ **Watch Video Solution**

97. In the figure given below, the imaginary line through the object and eye of the observer is called...........

A. line of sight

B. angle of depression

C. angle of elevation

D. none

Answer:

▶ **Watch Video Solution**

98. If a pole height 6m casts a shadow $2\sqrt{3}$m

long on the ground, then the sun's elevation is

A. $70°$

B. $20°$

C. $80°$

D. $60°$

Answer:

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99. The length of the shadow of a tree is 7m high, when the sun's elevation is..............

A. $45°$

B. $60°$

C. $70°$

D. $9.0°$

Answer:

▶ **Watch Video Solution**

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100. If two tangents inclined at an angle of $60°$ are drawn to a circle of radius 3 cm, then length of tangents is equal to………….m.

A. $4\sqrt{3}$

B. $2\sqrt{91}$

C. $\sqrt{3}$

D. $3\sqrt{3}$

Answer:

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

A. angle of elevation

B. angle of depression

C. equal angle

D. none

Answer:

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102. $\cot^2 B - \cos ec^2 B = \ldots\ldots\ldots$

A. 0

B. -1

C. 1

D. 2

Answer:

▶ **Watch Video Solution**

103. $\dfrac{\tan\theta}{\sec\theta}$ = ...

A. $-\cos\theta$

B. $\sin\theta$

C. $-\tan\theta$

D. none

Answer:

▶ **Watch Video Solution**

104. A boy observed the top of an electrical pole to be at angle of elevation of $60°$ when the observation point is 8m away from the foot of the pole then the height of the pole is..........m.

A. $18\sqrt{3}$

B. 14

C. $7\sqrt{3}$

D. $8\sqrt{3}$

Answer:

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105. Suppose you are shooting an arrow from

the top of a building at a height of 6 m to a

target on the ground at an angle of

depression of $60°$. What is the distance between you and the object ?

A. 9

B. $7\sqrt{3}$

C. $12\sqrt{3}$

D. None

Answer:

106. $\sin\left(\dfrac{\pi^c}{2}\right) =$

A. 4

B. 3

C. 1

D. -1

Answer:

▶ Watch Video Solution

107. Domain of $\sin \theta$=............

A. R

B. $R - \{30°\}$

C. N

D. none

Answer:

▶ Watch Video Solution

108. $\tan\left(\dfrac{\pi^c}{4}\right) =$

A. 2

B. 3

C. -1

D. 1

Answer:

▶ Watch Video Solution

109. $\cot 15^\circ =$

    A. $2 + \sqrt{3}$

    B. $2 - \sqrt{3}$

    C. $\sqrt{2}$

    D. $\sqrt{3} - 1$

Answer:

▶ **Watch Video Solution**

110. $A + B = 180°$ then $\cos A + \cos B$=...........

A. 4

B. 1

C. 0

D. none

Answer:

▶ Watch Video Solution

111. $\sin 15° =$

A. $\dfrac{\sqrt{3}}{9\sqrt{2}}$

B. $\dfrac{\sqrt{3} - 1}{2\sqrt{2}}$

C. $\dfrac{\sqrt{3} + 1}{2}$

D. none

Answer:

112.

$$\tan A = \frac{n}{n+1}, \tan B = \frac{1}{2n+1}, A + B$$

=...........

A. 4

B. 3

C. -1

D. 1

Answer:

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113. The angle of elevation of tower at a point 40m apart form it is $\cot^{-1}\left(\dfrac{3}{5}\right)$. Obtain the height of the tower.

A. $\dfrac{200}{3}m$

B. $\dfrac{100}{3}m$

C. $\dfrac{210}{17}m$

D. none

Answer:

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114. A ladder 20m long is placed against a vertical wall of height 10m, then the distance between the foot of the ladders and wll is......... m.

A. $7\sqrt{3}$

B. $20\sqrt{3}$

C. $30\sqrt{3}$

D. none

Answer:

115. $\sin 18° = $............

A. $\dfrac{\sqrt{5}}{4}$

B. $\dfrac{\sqrt{5} - 1}{4}$

C. $\dfrac{1 + \sqrt{3}}{2}$

D. $\dfrac{\sqrt{3} - 1}{4}$

Answer:

116. $\cot(90 - A) =$

A. $3\tan A$

B. $\sin A$

C. $\cot A$

D. $\tan A$

Answer:

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117. $\cos^4 A - \sin^4 A =$............

A. $\sin^2 A$

B. $\cos^2 A$

C. $\cos 2A$

D. $\cos 3A$

Answer:

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118. If $\cos ec\theta + \cot \theta = k$ then $\cos \theta$=............

A. $\dfrac{k^2 - 1}{k^2 + 1}$

B. $\dfrac{k^2}{k^2 - 1}$

C. $\dfrac{k^2 + 1}{k}$

D. none

Answer:

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119. $x = (\sec\theta + \tan\theta), y = (\sec\theta - \tan\theta)$

then xy=............

A. -1

B. O

C. 1

D. -2

Answer:

▶ **Watch Video Solution**

120. $\tan 15^\circ$ =.............

A. $\dfrac{\sqrt{3}}{\sqrt{3}+1}$

B. $\dfrac{\sqrt{3}-1}{\sqrt{3}+1}$

C. $\dfrac{\sqrt{3}-1}{2}$

D. none

Answer:

121. $\cos ec\theta$=...........

A. $\sqrt{1+\cot^2\theta}$

B. $\sqrt{\cot^2\theta-1}$

C. $\sqrt{1+\sin\theta}$

D. $\sqrt{\cot\theta - 1}$

Answer:

122. $x = a\sin\theta, y = a\cos\theta$ then $x^2 + y^2$

=............

A. $\dfrac{a}{3}$

B. $\dfrac{a}{2}$

C. a

D. a^2

Answer:

---

123. Example of a Pythagorean Triplet is..........

A. 5, 12, 13

B. 5, 10, 11

C. 8, 9, 11

D. none

Answer:

124. $\sec^2 A$=..............

    A. $1 - \tan^2 A$

    B. $1 + \tan^2 A$

    C. $\cot^2 A$

    D. none

Answer:

125. $\dfrac{1}{\cos\theta} - \cos\theta=$............

A. $\tan\theta.\sin\theta$

B. $\sec\theta.\cos\theta$

C. $\tan\theta.\cot\theta$

D. none

Answer:

126. $\sin\theta = \cos\theta, \theta \in Q_1$ then θ-

A. $\dfrac{\pi^c}{2}$

B. $\dfrac{\pi^c}{3}$

C. $\dfrac{2\pi^c}{4}$

D. $\dfrac{\pi^c}{4}$

Answer:

127. 72° =...............

A. $\dfrac{\pi^c}{2}$

B. $\dfrac{\pi^c}{3}$

C. $\dfrac{2\pi^c}{5}$

D. $\dfrac{\pi^c}{5}$

Answer:

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128. $\sin^2 105° + \cos^2 105° = \ldots\ldots\ldots\ldots$

A. 1

B. 0

C. 9

D. 10

Answer:

▶ Watch Video Solution

129. $\sin 45° (\cos 45°) =$ ....

A. 1

B. $\dfrac{1}{2}$

C. 3

D. none

Answer:

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130. $\cos 40° = 0.76$ then $\sin 50°$ =............

A. 0.76

B. 7.6

C. 76.6

D. none

Answer:

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131. At a point 15m away form the base of a 15m high pole, the angle of elevation of the top is..........

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer:

▶ Watch Video Solution

132. When the length of the shadow of a person is equal to his height, then the elevation of source of light is

A. 15°

B. 30°

C. 45°

D. 60°

Answer:

133. The angle of elevation of top of a tree is $30°$. On moving 20m nearer, the angle of elevation is $60°$. The height of the tree is

A. $15\sqrt{3}m$

B. $2\sqrt{3}m$

C. $10\sqrt{3}m$

D. $5\sqrt{m}$

Answer:

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134. The ratio of length of a pole and its shadow is $1:\sqrt{3}$. The angle of elevation is

A. $90°$

B. $60°$

C. $45°$

D. $30°$

Answer:

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135. The upper part of a tree is broken by wind and makes an angle of $30°$ with the ground and at a distance of 21m from the foot of the tree. Find the total height of the tree.

A. $30\sqrt{3}m$

B. 21 m

C. 30 m

D. $21\sqrt{3}$ m

Answer:

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136. From a bridge 25m high, the angle of depression of a boat is $45°$. Find the horizontal distance of the boat from the bridges.

A. $25\sqrt{3}$ m

B. 25 m

C. $\dfrac{25}{\sqrt{3}}$ m

D. 45 m

Answer:

137. A tower makes an angle of elevation equal to the angle of depression from the top of a cliff 25m height. Find the heigh of the tower.

    A. 25 m

    B. 75 m

    C. 5 m

    D. 50 m

Answer:

138. When the angle of elevation of a pole is $45°$, the length of the pole and its shadow are

A. equal

B. $\leq n > h > shadow$

C. shadow $>$ length

D. none of the above

Answer:

139. In a rectangle, if the angle between a diagonal and a side is $30°$, and the length of the diagonal is 6 cm, the area of the rectangle is

A. $18cm^2$

B. $9cm^2$

C. $18\sqrt{3}cm^2$

D. $9\sqrt{3}cm^2$

Answer:

---

140. Two posts are 15 m and 25m high and the line joining their tope make an angle of $45°$ with the horizontal, the distance between the two posts is

    A. 15 m

    B. 25 m

    C. 18 m

D. 10 m

Answer:

141. An electric pole 20m high stands up right on the ground with the help of steel wire to its top and affixed on the ground. If the steel wire makes $60°$ with the horizontal ground, find the length of steel wire.

A. $60\sqrt{3}$ m

B. 20 m

C. 60 m

D. $\dfrac{20}{\sqrt{3}}$ m

Answer:

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142. A building casts a shadow of length $50\sqrt{3}$ m when the sun is $30°$ about the horizontal. The height of the building is

A. 30 m

B. 40 m

C. 50 m

D. 60 m

Answer:

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143. When the angle of elevation of a light changes from $30°$ to $45°$, the shadow of

pole becomes $100\sqrt{3}$ m less. The height of the pole is

A. 30 m

B. 120 m

C. 75 m

D. 100 m

Answer:

144. From the top of a building 50m from horizontal, the angle of depression made by a car is $30°$. How far is the car from the building?

A. $\dfrac{50}{\sqrt{3}}$ m

B. $50\sqrt{3}$ m

C. 150 m

D. $30\sqrt{3}$ m

Answer:

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145. From the top of a building with height $30(\sqrt{3}+1)$ m two cars make angle of depression of $45°$ and $30°$ due east. What is the distance between two cars?

A. 30 m

B. 60 m

C. 45 m

D. 75 m

Answer:

146. A person standing on the bank of a river observes that the angle subtended by a tree on the opposite bank is $60°$. When he retires 40m from the bank, he finds the angle to be $30°$. The breadth of the river is

A. 10 m

B. 15 m

C. 20 m

D. 25 m

Answer:

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147. A ladder of 10 m length touches a wall at a height of 5 m. The angle made by it with the horizontal is

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer:

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148. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground by making $30°$ angle with the ground. The distance between the top of

the tree and the ground is 10m. Find the height of the tree.

A. 10 m

B. $30\sqrt{3}$ m

C. $10\sqrt{3}$ m

D. 30 m

Answer:

149. The angle of elevation of a cloud from a point 200 m above the lake is $30°$ and the angle of depression of its. reflection in the lake is $60°$. The height of the cloud above the lake is

   A. 100 m

   B. 200 m

   C. 300 m

   D. 400 m

Answer:

150. An aeroplane flying horizontally 1 km above the ground is observed at an elevation of $60°$. After a flight of 10 seconds, its angle of elevation is observed to be $30°$ from the same point on the ground. Find the speed of the aeroplane.

    A. $415.7 km/h$

    B. $215.3 km/h$

    C. $700 km/h$

D. none of the above

Answer:

▶ **Watch Video Solution**

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151. If $AB=4m$, and $AC=8m$, then the angle of elevation of A as observed from C is

A. 30°

B. 45°

C. 60°

D. 90°

Answer:

---

152. If a pole height 6m casts a shadow $2\sqrt{3}m$ long on the ground, then the sun's elevation is

A. 30°

B. 60°

C. 45°

D. $90°$

Answer:

153. Find the elevation of the sun at the moment when the length of the shadow of a tower is just equal to its height.

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer:

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154. If the shadow of a tree is $\dfrac{1}{\sqrt{3}}$ times the height of the tree, then the angle of elevation of the sun is

A. $30°$

B. $45°$

C. $60°$

D. $90°$

Answer:

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