



# MATHS

## BOOKS - AGRAWAL PUBLICATION

### SAMPLE PAPER 4

#### Exercise

1. What is the common zero of the polynomial

$$x^3 + 1, x^2 - 1 \text{ and } x^2 + 2x + 1?$$





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2. If  $p$ ,  $2p - 1$ ,  $2p + 1$  are three consecutive terms of an A.P., then what is the value of  $p$  ?



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3. In which quadrant does the point  $(-1, -2)$  lie?



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4. The perimeter of a triangle with vertices (0,4), (0,0) and (3,0) is



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5. If radii of two concentric circles are 4 cm and 5 cm, then length of each chord of one circle which is tangent to the other circle, is



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6. Find the value of  $\sqrt{\sec^2 45^\circ - \cot^2 45^\circ}$



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7. If  $\tan x = \sin 45^\circ \cos 45^\circ + \sin 30^\circ$  then  $x$  is equal to



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8. What is the area of a circle inscribed in a square of side 'a' units?



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**9.** A car travels 0.99 km in which each wheel makes 450 complete revolutions. Find radius of the wheel.



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**10.** A number from 11 to 30 was chosen at random. Find the probability of this chosen number being a multiple of 2.



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11. If  $\alpha$  and  $\beta$  are the zeros of the polynomial

$$p(x) = x^2 - px + q,$$

then find the value of  $\frac{1}{\alpha} + \frac{1}{\beta}$



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12. Find the sum of first 20 even numbers.



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13. Find the discriminant of the quadratic

equation  $(p + 3)x^2 - (5 - p)x + 1 = 0$  and

hence determine the value of  $p$  for which the roots are real and distinct.



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14. In  $ABC$ ,  $DE$  is parallel to base  $BC$ , with  $D$  on  $AB$  and  $E$  on  $AC$ . If  $\frac{AD}{DB} = \frac{2}{3}$ , find  $\frac{BC}{DE}$ .



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15. In a frequency distribution, what does ogive help in calculating?



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16. Find the  $8^{th}$  term from the end of the A.P.

$-12, -7, -2, \dots, 68$



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17. State *SAS* similarity criterion.



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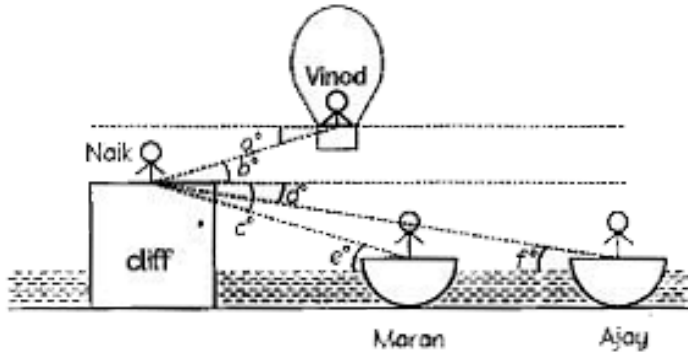
**18.** Mr. Naik is a paramilitary Intelligence Corps officer who is tasked with planning a coup on the enemy at a certain date. Currently he is inspecting the area standing on top of the cliff. Agent Vinod is on a hot air balloon in the sky. When Mr. Naik looks down below the cliff towards the sea, he has Ajay and Maran in boats positioned to get a good vantage point.

The main goal is to scope out the range and angles at which they should train their soldiers.

Ajay's boat is 25 m away from the base of the cliff.

If  $\angle d = 30^\circ$ . What is the height of the cliff?

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



A. 17.5 ,

B. 12.26 m

C. 14. 45m

D. 15.4m

**Answer:**



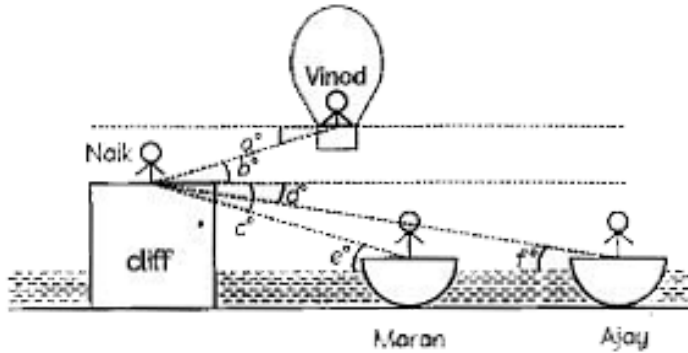
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**19.** Mr. Naik is a paramilitary Intelligence Corps officer who is tasked with planning a coup on the enemy at a certain date. Currently he is inspecting the area standing on top of the cliff. Agent Vinod is on a hot air balloon in the sky. When Mr. Naik looks down below the cliff towards the sea, he has Ajay and Maran in boats positioned to get a good vantage point.

The main goal is to scope out the range and angles at which they should train their soldiers.

If the height of the cliff is  $30m$ ,  $\angle c = 45^\circ$  and  $\angle d = 30^\circ$ , distance between the two boats is

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



- A. 6.8 m
- B. 8.5 m
- C. 11.2 m
- D. 21.9 m

**Answer:**

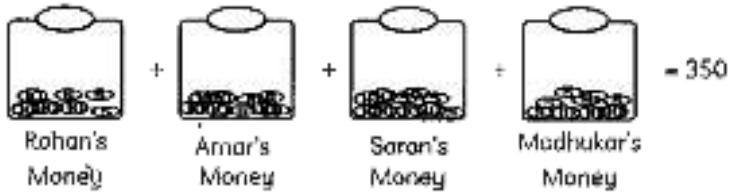


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**20.** To celebrate Diwali festival among senior citizens of an old home, four friends of a society, Rohan, Amar, Saran and Madhukar decided to pool some money to gift packs to every old man/woman staying in the neighbouring old-age home. They pooled money in the ratio 2 : 3 : 4 : 5. With the pooled money of Rs.3500, they start preparing gift packs. In the preparation of one gift pack, Rohan, Amar, Saran and Madhukar spend 7, 6, 8 and 9 minutes respectively.

On the basis of the above information, answer any four of the following questions:

How much amount was pooled by Saran?



- A. Rs 500
- B. Rs 750
- C. Rs 1000
- D. Rs 1250

**Answer:**



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**21.** To celebrate Diwali festival among senior citizens of an old home, four friends of a society, Rohan, Amar, Saran and Madhukar decided to pool some money to gift packs to every old man/woman staying in the neighbouring old-age home. They pooled money in the ratio 2 : 3 : 4 : 5. With the pooled money of Rs.3500, they start preparing gift packs. In the preparation of one gift pack, Rohan, Amar, Saran and Madhukar spend 7, 6, 8 and 9 minutes respectively.

On the basis of the above information, answer any four of the following questions:

How much time (in minutes) was spent on one

gift?

Rohan's Money + Amar's Money + Saran's Money + Madhukar's Money = 350

A. 20

B. 25

C. 30

D. 40

**Answer:**



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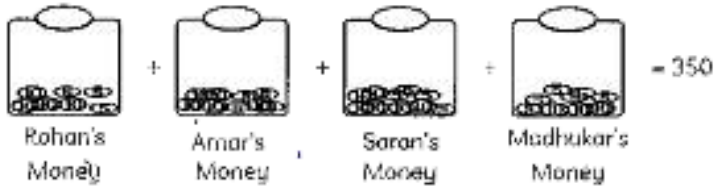


**22.** To celebrate Diwali festival among senior citizens of an old home, four friends of a society, Rohan, Amar, Saran and Madhukar decided to pool some money to gift packs to every old man/woman staying in the neighbouring old-age home. They pooled money in the ratio 2 : 3 : 4 : 5. With the pooled money of Rs.3500, they start preparing gift packs. In the preparation of one gift pack, Rohan, Amar, Saran and Madhukar spend 7, 6, 8 and 9 minutes respectively.

On the basis of the above information, answer any four of the following questions:

If each gift costs to them Rs.70, how many senior

citizens were given the cards ?



A. 35

B. 50

C. 54

D. 60

**Answer:**



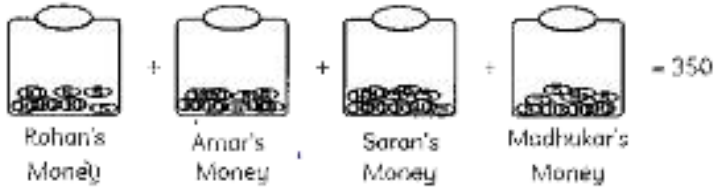
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**23.** To celebrate Diwali festival among senior citizens of an old home, four friends of a society, Rohan, Amar, Saran and Madhukar decided to pool some money to gift packs to every old man/woman staying in the neighbouring old-age home. They pooled money in the ratio 2 : 3 : 4 : 5. With the pooled money of Rs.3500, they start preparing gift packs. In the preparation of one gift pack, Rohan, Amar, Saran and Madhukar spend 7, 6, 8 and 9 minutes respectively.

On the basis of the above information, answer any four of the following questions:

How much amount was pooled by Rohan and

Madhukar together for giving the gifts?



A. Rs 1856

B. Rs 1750

C. Rs 1623

D. Rs 2150

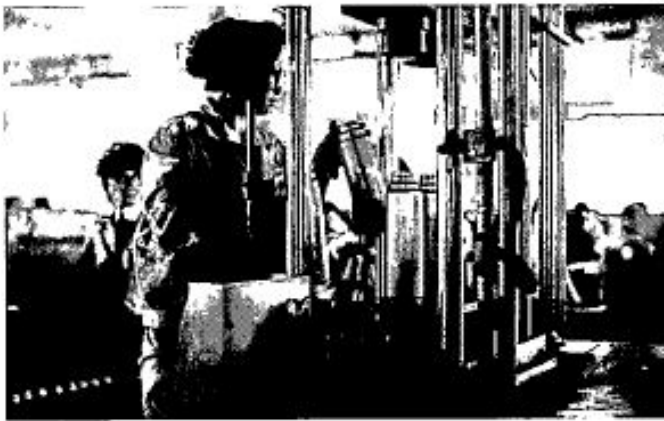
**Answer:**

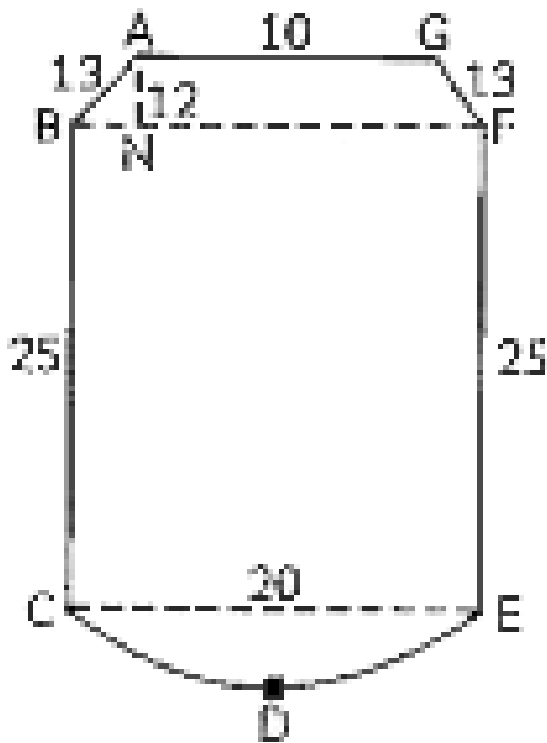


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**24.** Thermas Housewares Co. Ltd is one of the leading brands in the field of vacuum flask. They are producing a new high-quality heat preservation flask series and the below figure shows the cross - section of the interior part of a new concept thermos flask.

The top part is a trapezium, the middle part is a rectangle and the bottom part is a semi-circle





The dimension of various parts are:

$CE = 20$  cm,  $BC = 25$  cm,  $AB = GF = 13$  cm,  $AG = 10$  cm and  $AN = 12$  cm

The perimeter of the trapezium part of the cross section, is

A. 36 cm

B. 56 cm

C. 30 cm

D. 46 cm

**Answer:**



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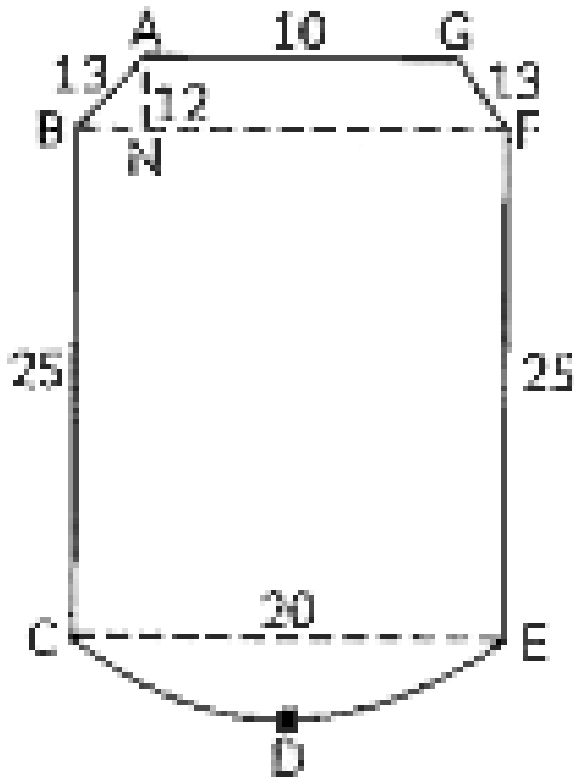
25. Thermas Housewares Co. Ltd is one of the leading brands in the field of vacuum flask. They are producing a new high-quality heat

preservation flask series and the below figure shows the cross - section of the interior part of a new concept thermos flask.

The top part is a trapezium, the middle part is a rectangle and the bottom part is a semi-circle







The dimension of various parts are:

$CE = 20$  cm,  $BC = 25$  cm,  $AB = GF = 13$  cm,  $AG = 10$  cm and  $AN = 12$  cm

The perimeter of the rectangular part of the cross section, is

A. 90 cm

B. 70 cm

C. 50 cm

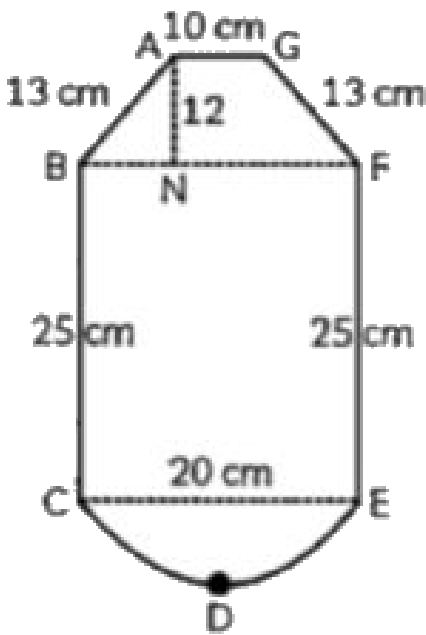
D. 40 cm

**Answer:**



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**26.** The figure shows the cross-section of the interior of thermos flask .



The top part is a trapezium , the middle part is a rectangle and the bottom part is a semicircle if  $CE = 20 \text{ cm}$  ,  $BC = 25 \text{ cm}$  ,  $AB = GF = 13 \text{ cm}$  ,  $AG = 10 \text{ cm}$  and  $AN = 12 \text{ cm}$  , the find :

The perimeter of the cross-section

A. 83 cm

B. 86 cm

C. 117.4 cm

D. 130.4 cm

**Answer:**



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27. Without actually performing the long division,

write the decimal expansion of  $\frac{11725}{2^3 \times 5^4}$



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28. Show that  $3 + \sqrt{5}$  is an irrational number, assuming that  $\sqrt{5}$  is an irrational number.



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29. Solve algebraically:  $4x + 3y = 14$  and  $3x - 4y = 23$ .



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30.

Evaluate:

$$(\sin^4 60^\circ + \sec^4 30^\circ) - 2(\cos^2 45^\circ - \sin^2 90^\circ)$$

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31. Prove that  $\frac{\sin \theta - 2 \sin^3 \theta}{2 \cos^3 \theta - \cos \theta} = \tan \theta$

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32. A die is thrown twice. Find the probability that:

5 will not come up either time

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**33.** Find a point on x - axis which is equidistant from A (-3, 4) and B(7, 6).



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**34.** If the circumference of a circle increases from  $4\pi$  to  $8\pi$ , then find the percentage increase in the area of the circle.



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**35.** The sum of the squares of two consecutive multiples of 7 is 637. Find the multiples.

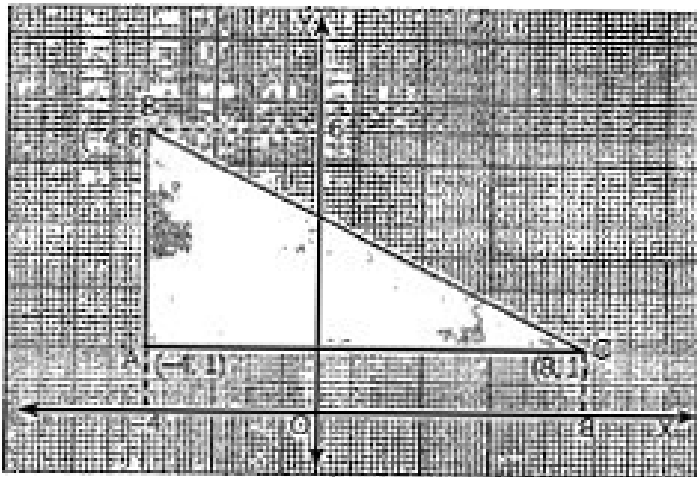


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**36.** The figure drawn on the graph paper shows a  $\triangle ABC$  with vertices A (-4, 1) B(-4, 6) and C (8, 1).



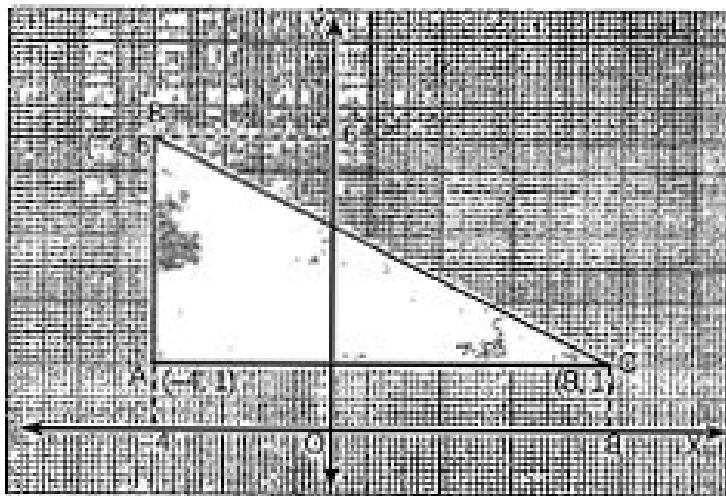
Find the length of BC,



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**37.** The figure drawn on the graph paper shows a  $\triangle ABC$  with vertices A (-4, 1) B(-4, 6) and C (8, 1).

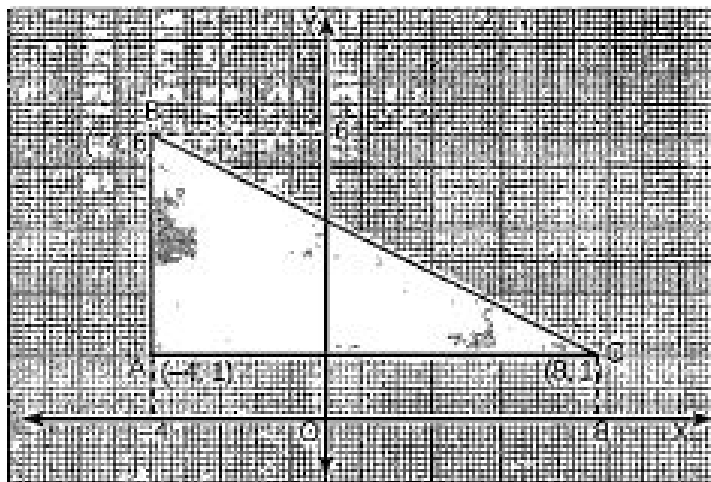
Find  $\sin B$



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**38.** The figure drawn on the graph paper shows a  $\triangle ABC$  with vertices  $A (-4, 1)$   $B(-4, 6)$  and  $C (8, 1)$ .

Find  $\cos C$



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39. Prove that the length of the tangents drawn from an external point to a circle are equal.



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**40.** Two spotlights, P and Q are mounted on a vertical pole AB as shown.

Light beams from P and Q shine to two points on the ground, H and K, respectively. Given that  $PQ = 16\text{m}$ ,  $KB = 16\text{m}$ ,  $PH = 35\text{m}$  and  $QK = 20\text{m}$ , Find:  $HK$ , the distance between the projections of the light beams.



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**41.** The minute hand of a clock is 2 cm long. Find the area of the face of the clock described by the

minute hand between 7 am and 7 : 15 am.



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**42.** Two spheres of same metal weight 1 Kg and 7 Kg. The radius of the smaller sphere is 3 cm. The two spheres are melted to form a single big sphere. Find the diameter of the new sphere.



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**43.** A bag contains 15 white balls and some black balls. If the probability of drawing a black ball is

thrice that of a white ball, find the number of black balls in the bag.



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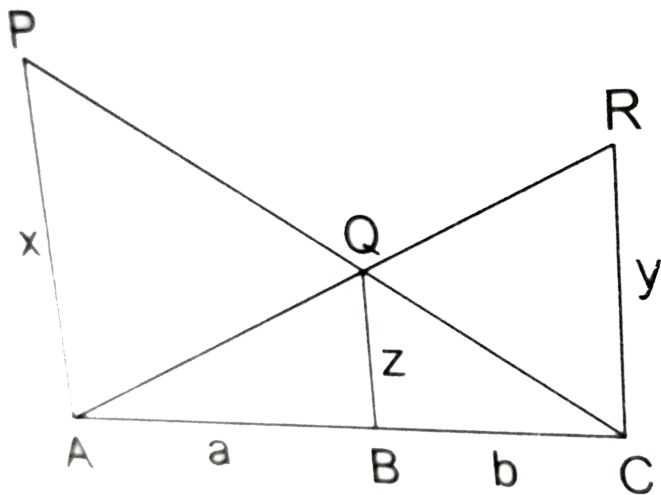
**44.** Two men on either side of a 75 m high building and in line with base of building observe the angle of elevation of the top of the building as  $30^\circ$  and  $60^\circ$ . Find the distance between the two men. (Use  $\sqrt{3} = 1.73$ )



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45. In the given figure,  $PA$ ,  $QB$  and  $RC$  each is perpendicular to  $AC$  such that  $PA = x$ ,  $RC = y$ ,  $QB = z$ ,  $AB = a$ , and  $BC = b$

Prove that  $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$



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**46.** Using factorisation, find the HCF of 36 and 54.



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**47.** Write a rational number and an irrational number between 1 and 2.



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**48.** Find the zeros of the polynomial  $p(x) = x^2 - 7x + 6$



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49. Find the discrimination of the quadratic equation  $x^2 - 4x + 1 = 0$



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50. Which term of the A.P. 4,9,14 is 254?



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51. Find the sum of the first 20 natural numbers.



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**52.** Find the centroid of  $\triangle ABC$ , where  $A(-4, 6)$ ,  $B(2, -2)$  and  $C(2, 5)$



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**53.** A man goes 15 m due west and then 8 m due north. How far is he from the starting point?



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54. Prove that  $4 \tan^2 A - 4 \sec^2 A = -4$



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55. If  $\tan A = \frac{3}{4}$ , find the value of  $\sin A$ .



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56. If the perimeter of a semi-circular protractor is 36 cm, then its diameter is (a) 10 cm (b) 12 cm (c) 14 cm (d) 16 cm



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**57.** The chord of a circle of radius  $10\text{cm}$  subtends a right angle at its centre. The length of the chord (in cm) is



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**58.** A box contains 20 balls bearing numbers - 1, 2, 3, 4, ..., 20.

A ball is drawn at random from the box. What is the probability that the number on the ball is divisible by 7?



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**59.** Mean of twenty observations is 15. If two observations 3 and 14 replaced by 8 and 9 respectively, then the new mean will be



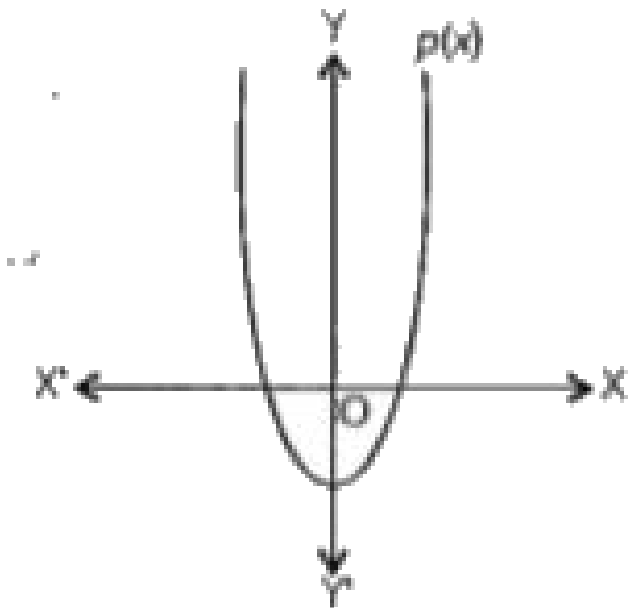
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**60.** If the mean and mode of a discrete data is 6 and 9, find the median of the data.



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61. Write the number of zeros for a polynomial  $p(x)$  whose graph is given in the figure.



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**62.** Write a pair of linear equations which has the unique solution  $x = -1, y = 3$



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**63.** The quadratic equation  $2x^2 + px + 3 = 0$  has two equal roots. Find the value of  $p$ .



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**64.** Construct a tangent to a circle of radius 4cm from a point which is at a distance of 6 cm from

its centre.



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**65.** The perimeters of two similar triangles are 30 cm and 20 cm respectively. If one side of the first triangle is 9 cm long, find the length of the corresponding side of the second triangle.



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**66.** In a circle of radius 7 cm, tangent PT is drawn from a point P such that  $PT=24$  cm. If O is the



center of circle then length  $OP=?$



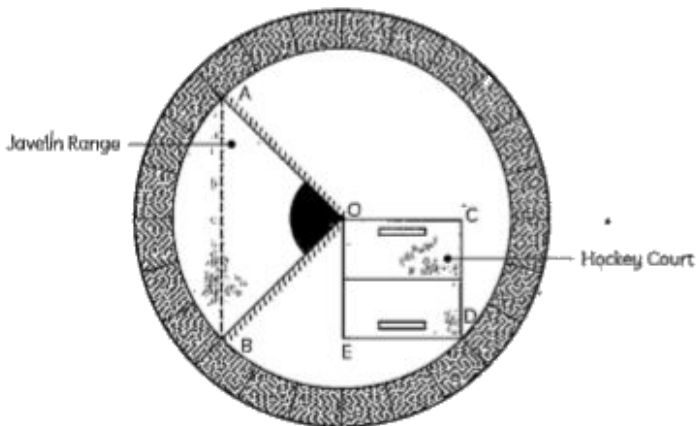
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**67.** Jawaharlal Nehru Stadium in New Delhi is conducting the annual sports competition soon.

The curator of the stadium is tasked with preparing the grounds for various sports as per the technical requirements of sports invigilator.

The engineer assigned to assist the curator is tasked with figuring out the dimensions for carving out some areas allotted for a 'hockey court' and a 'javelin range', as shown in the figure

below.



The shapes of the 'hockey court' and the 'javelin range' are square and triangle respectively. Both

of the courts have a common edge that touches the centre of stadium. The construction of the javelin range is such that the angle to centre is  $90^\circ$ . The radius of the stadium is 200 metres.

The area (in sq m) allotted to 'javelin' range' is

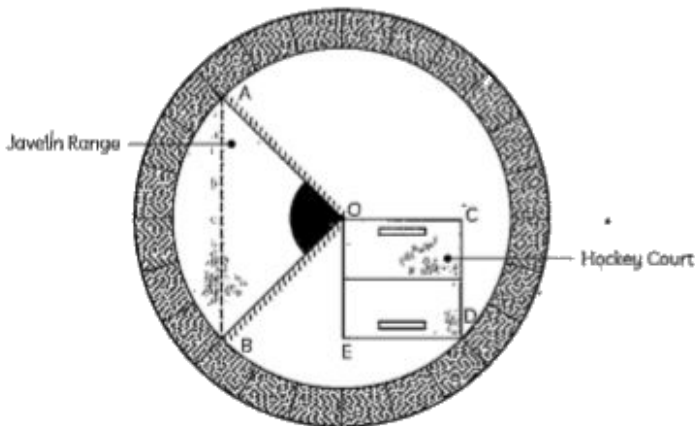
- A. 11400
- B. 20000
- C. 31400
- D. 40000

**Answer:**





**68.** Jawaharlal Nehru Stadium in New Delhi is conducting the annual sports competition soon. The curator of the stadium is tasked with preparing the grounds for various sports as per the technical requirements of sports invigilator. The engineer assigned to assist the curator is tasked with figuring out the dimensions for carving out some areas allotted for a 'hockey court' and a 'javelin range', as shown in the figure below.



The shapes of the 'hockey court' and the 'javelin range' are square and triangle respectively. Both of the courts have a common edge that touches

the centre of stadium. The construction of the javelin range is such that the angle to centre is  $90^\circ$ . The radius of the stadium is 200 metres.

The area (in sq m) allotted to 'javelin' range' is

- A. 11400
- B. 20000
- C. 31400
- D. 40000

**Answer:**

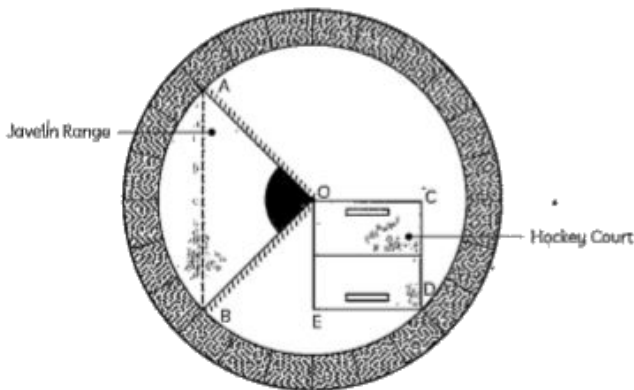


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**69.** Jawaharlal Nehru Stadium in New Delhi is conducting the annual sports competition soon.

The curator of the stadium is tasked with preparing the grounds for various sports as per the technical requirements of sports invigilator.

The engineer assigned to assist the curator is tasked with figuring out the dimensions for carving out some areas allotted for a 'hockey court' and a 'javelin range', as shown in the figure below.



The shapes of the 'hockey court' and the 'javelin range' are square and triangle respectively. Both of the courts have a common edge that touches



the centre of stadium. The construction of the javelin range is such that the angle to centre is  $90^\circ$ . The radius of the stadium is 200 metres.

If the team of the curators managing the stadium, likes to allot space for some more sports, how much area (in sq m) is available to them?

A. 1,25,600

B. 1,05,600

C. 85600

D. 58600

**Answer:**



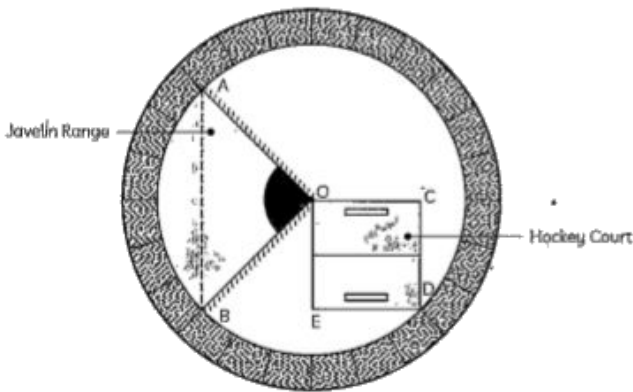
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**70.** Jawaharlal Nehru Stadium in New Delhi is conducting the annual sports competition soon.

The curator of the stadium is tasked with preparing the grounds for various sports as per the technical requirements of sports invigilator.

The engineer assigned to assist the curator is tasked with figuring out the dimensions for carving out some areas allotted for a 'hockey court' and a 'javelin range', as shown in the figure

below.



The shapes of the 'hockey court' and the 'javelin range' are square and triangle respectively. Both

of the courts have a common edge that touches the centre of stadium. The construction of the javelin range is such that the angle to centre is  $90^\circ$ . The radius of the stadium is 200 metres.

If the boundaries of the hockey court and javelin range are to be fenced, then the total length (in m) of the fence required is

A.  $100(2 + 3\sqrt{2})$

B.  $100(2 + 5\sqrt{2})$

C.  $200(2 + 5\sqrt{2})$

D.  $200(2 + 3\sqrt{2})$

**Answer:**



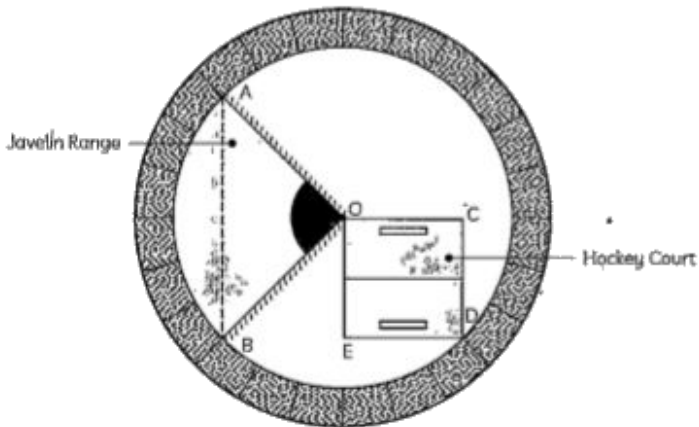
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**71.** Jawaharlal Nehru Stadium in New Delhi is conducting the annual sports competition soon.

The curator of the stadium is tasked with preparing the grounds for various sports as per the technical requirements of sports invigilator.

The engineer assigned to assist the curator is tasked with figuring out the dimensions for carving out some areas allotted for a 'hockey court' and a 'javelin range', as shown in the figure

below.



The shapes of the 'hockey court' and the 'javelin range' are square and triangle respectively. Both

of the courts have a common edge that touches the centre of stadium. The construction of the javelin range is such that the angle to centre is  $90^\circ$ . The radius of the stadium is 200 metres.

If the cost of fencing is Rs 12 per metre, then the total cost of fencing is

A.  $1200(2 + 3\sqrt{2})$

B.  $1200(2 + 5\sqrt{2})$

C.  $2400(2 + 5\sqrt{2})$

D.  $2400(2 + 3\sqrt{2})$

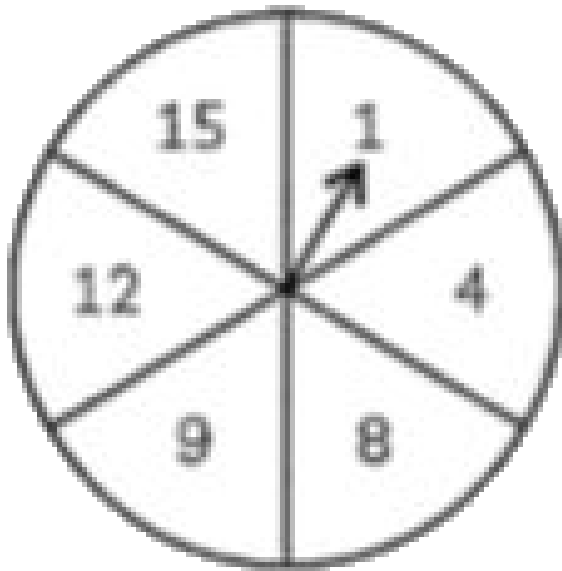
**Answer:**



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**72.** A game at a stall in Diwali fare involves using a spinner first as a pre-cursor to complete the game with certain rules. If the spinner stops at a particular number, then the player is allowed to roll a 6. faced unbiased die,





What is the probability of getting an odd number on the spinner?

A.  $\frac{1}{4}$

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

C.  $\frac{1}{8}$

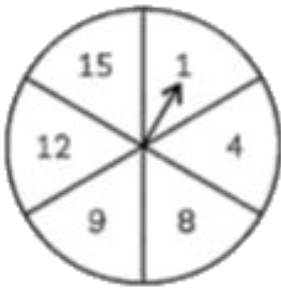
D.  $\frac{1}{16}$

**Answer:**



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**73.** A game at a stall in Diwali fare involves using a spinner first as a pre-cursor to complete the game with certain rules. If the spinner stops at a particular number, then the player is allowed to roll a 6. faced unbiased die,



If getting an even number on the spinner allows a player to roll the die, then the probability of his rolling the die is

A.  $\frac{1}{4}$

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

C.  $\frac{1}{8}$

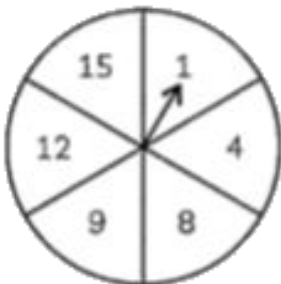
D.  $\frac{1}{16}$

**Answer:**



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**74.** A game at a stall in Diwali fare involves using a spinner first as a pre-cursor to complete the game with certain rules. If the spinner stops at a particular number, then the player is allowed to roll a 6. faced unbiased die,



If getting an even number on the spinner allows a player to roll the die, then the probability of his rolling the die is

A.  $\frac{1}{4}$

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

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

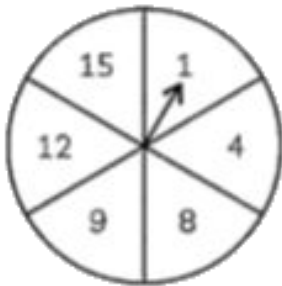
D.  $\frac{1}{6}$

**Answer:**



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75. A game at a stall in Diwali fare involves using a spinner first as a pre-cursor to complete the game with certain rules. If the spinner stops at a particular number, then the player is allowed to roll a 6. faced unbiased die,



If getting a square number on the spinner allows a player to roll the die, then the probability of his rolling the die is

A.  $\frac{3}{4}$

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

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

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

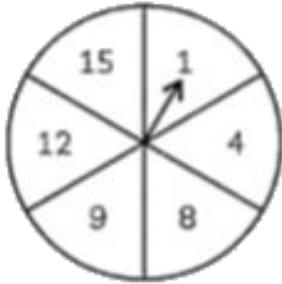
**Answer:**



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**76.** A game at a stall in Diwali fare involves using a spinner first as a pre-cursor to complete the game with certain rules. If the spinner stops at a

particular number, then the player is allowed to roll a 6. faced unbiased die,



If the player is allowed to roll the die and getting a prime number entitles him to get prize, then the probability of his winning the prize is

A.  $\frac{3}{4}$

B.  $\frac{1}{6}$

C.  $\frac{1}{2}$



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

**Answer:**



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**77.** Radio towers are typically tall structures designed to support antennas for telecommunications and broadcasting, including television. There are 2 main types: guyed and self-supporting structures.

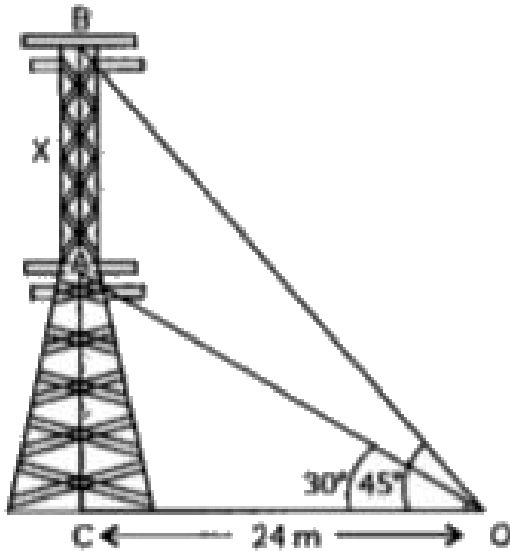
They are among the tallest human-made structures. Masts are often named after the

broadcasting organizations that originally built them or currently use them.



On a similar concept, a radio - station tower was built in two sections A and B. From a point 24 m

from the base of the tower, the angle of elevation of the top of section A is  $30^\circ$  and the angle of elevation of the top of section B is  $45^\circ$  ).



The height of the section A is

- A. 13.84 m
- B. 14.6 m
- C. 16.7 m

D. 34.5 m

**Answer:**



**Watch Video Solution**

**78.** Radio towers are typically tall structures designed to support antennas for telecommunications and broadcasting, including television. There are 2 main types: guyed and self-supporting structures.

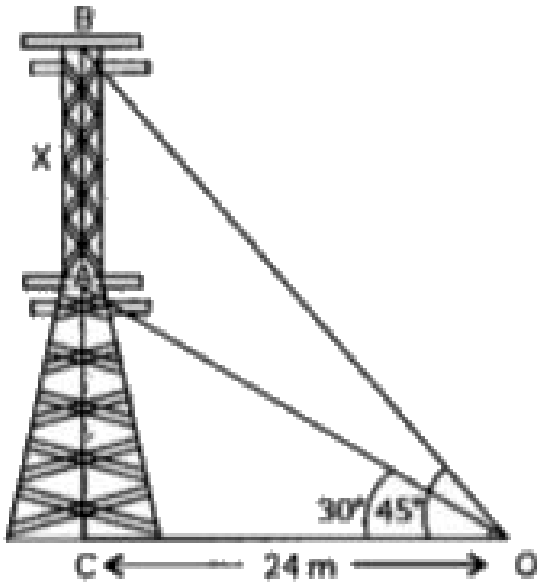
They are among the tallest human-made structures. Masts are often named after the

broadcasting organizations that originally built them or currently use them.



On a similar concept, a radio - station tower was built in two sections A and B. From a point 24 m from the base of the tower, the angle of elevation

of the top of section A is  $30^\circ$  and the angle of elevation of the top of section B is  $45^\circ$  ).



The height of the section B is

- A. 5.4 m
- B. 3.3 m
- C. 6.16 m

D. 10.16 m

**Answer:**



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**79.** Radio towers are typically tall structures designed to support antennas for telecommunications and broadcasting, including television. There are 2 main types: guyed and self-supporting structures.

They are among the tallest human-made structures. Masts are often named after the

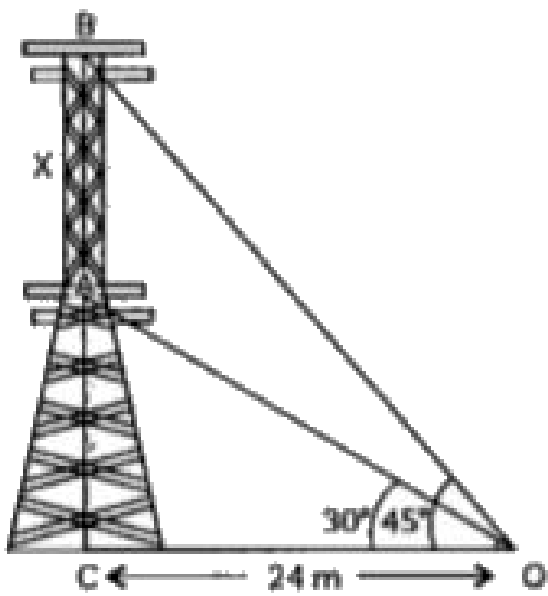
broadcasting organizations that originally built them or currently use them.



On a similar concept, a radio - station tower was built in two sections A and B. From a point 24 m from the base of the tower, the angle of elevation



of the top of section A is  $30^\circ$  and the angle of elevation of the top of section B is  $45^\circ$  ).



The height of the tower is

- A. 17.9 m
- B. 24 m
- C. 31.6 m

D. 20 m

**Answer:**



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**80.** Radio towers are typically tall structures designed to support antennas for tele communications and broadcasting, including television. There are 2 main types: guyed and self-supporting structures.

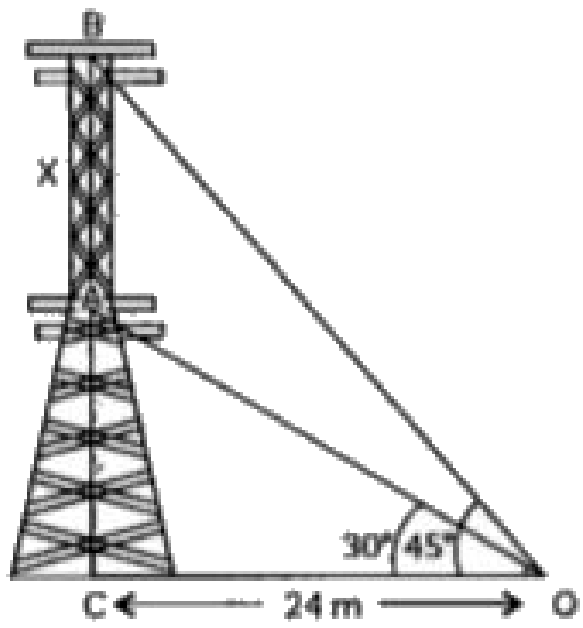
They are among the tallest human-made structures. Mosts are often named after the

broadcasting organizations that originally built them or currently use them.



On a similar concept, a radio - station tower was built in two sections A and B. From a point 24 m from the base of the tower, the angle of elevation

of the top of section A is  $30^\circ$  and the angle of elevation of the top of section B is  $45^\circ$  ).



On the basis of the above information, answer any four of the following question:

The length of the wire structure from the point to the top of section A is

- A. 11.8 m

B. 14.6 m

C. 27.7 m

D. 33.84 m

**Answer:**



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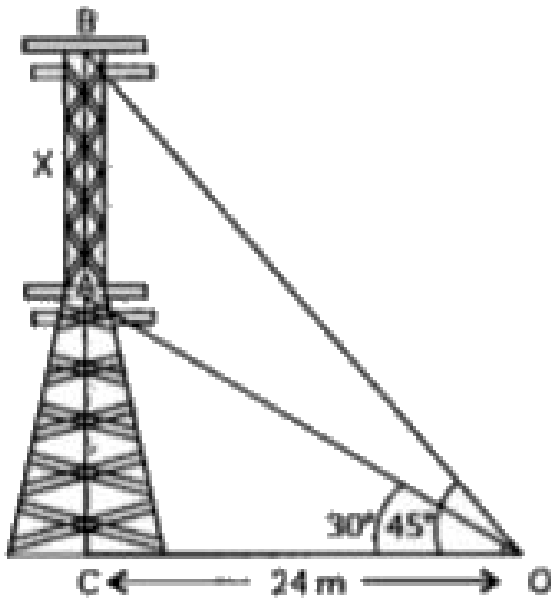
**81.** Radio towers are typically tall structures designed to support antennas for tele communications and broadcasting, including television. There are 2 main types: guyed and self-supporting structures.

They are among the tallest human-made structures. Masts are often named after the broadcasting organizations that originally built them or currently use them.



On a similar concept, a radio - station tower was

built in two sections A and B. From a point 24 m from the base of the tower, the angle of elevation of the top of section A is  $30^\circ$  and the angle of elevation of the top of section B is  $45^\circ$ ).



On the basis of the above information, answer any four of the following question:

The length of the wire structure from the point o to the top of section B is

A. 11.8 m

B. 14.6 m

C. 27.7 m

D. 33.84 m

**Answer:**



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**82.** Two unbiased coins are tossed . Find the probability of getting : (i) two heads and (ii) at least one head .





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**83.** If  $\alpha, \beta$  are zeroes of the quadratic polynomial

$p(x) = 2x^2 - Kx + 7$  such that

$\alpha^2 + \beta^2 - \frac{1}{2}\alpha\beta = \frac{23}{2}$ . Find the value of  $K$ .



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**84.** Find a relation between  $x$  and  $y$  such that the

point  $(x, y)$  is equidistant from the point  $(3, 6)$

and  $(-3, 4)$ .



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**85.** Show that the points  $(4,2)$  ,  $(7,5)$  and  $(9,7)$  are collinear.



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**86.** If the circumference of a circle increases from  $4\pi$  to  $8\pi$ , then find the percentage increase in the area of the circle.



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**87.** If 0.3528 is expressed in the form of  $\frac{p}{2^m 5^n}$  find the smallest values of m, n and p.



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**88.** Using prime factorisation, find the LCM of 150 and 210.



**Watch Video Solution**

**89.** Prove that  $\sqrt{2}$  is an irrational number



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**90.** Solve for  $x$  and  $y$ :

$$3x + 2y = 11,$$

$$2x + 3y = 4$$



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**91.** Two poles of height ' $a$ ' metres and ' $b$ ' meters are ' $p$ ' meters apart. Prove that the height of the point of intersection of the lines joining the top

of each pole to the foot of the opposite pole is

given by  $\frac{ab}{a+b}$  meters.



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**92.** If two adjacent vertices of a parallelogram are  $(3, 2)$  and  $(-1, 0)$  and the diagonals intersect at  $(2, -5)$ , then find the coordinates of the other two vertices.



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93. In a circle of radius 7 cm , a chord makes an angle of  $60^\circ$  at the centre of the circle . Find (a) area of the circle (b) area of sector AOB and ( c) area of minor segment APB.



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



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**94.** A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm, find the volume of the wooden toy.



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**95.** In Fig. 10.13,  $XY$  and  $X'Y'$  are two parallel tangents to a circle with centre  $O$  and another tangent  $AB$  with point of contact  $C$  intersecting

$XY$  at A and  $X'Y'$  at B. Prove that

$$\angle AOB = 90^\circ$$



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**96.** Find the zeroes of the polynomial  $p(x) = 4x^2 - 7x + 3$  by factorising it and verify the relationship between the zeroes and coefficients of  $p(x)$ .



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**97.** State and prove the Pythagoras theorem.





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98. If  $\angle B$  of  $\triangle ABC$  is an acute angle and  $AD \perp BC$ ; prove that  $AC^2 = AB^2 + BC^2 - 2BC \cdot CD$



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99. In a  $\triangle ABC$ ,  $\angle B$  is an acute-angle and  $AD \perp BC$ . Prove that:

$$AB^2 + CD^2 = AC^2 + BD^2$$



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