MATHS

BOOKS - AGRAWAL PUBLICATION

SAMPLE PAPER 1

Exercise

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1. Express 156 as the product of primes.

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2. Write a quadratic polynomial, sum of whose zeroes is 2 and product is -8

3. Given that HCF (96,404) is 4, find the LCM (96,404)

4. What is fundamental Theorem ?

5. If a and b are co-prime numbers, then find the HCF (a, b)

6. A horse tied to a pole with 28m long rope. Find the perimeter of the field where the horse can graze. (take $\pi = 22/7$)

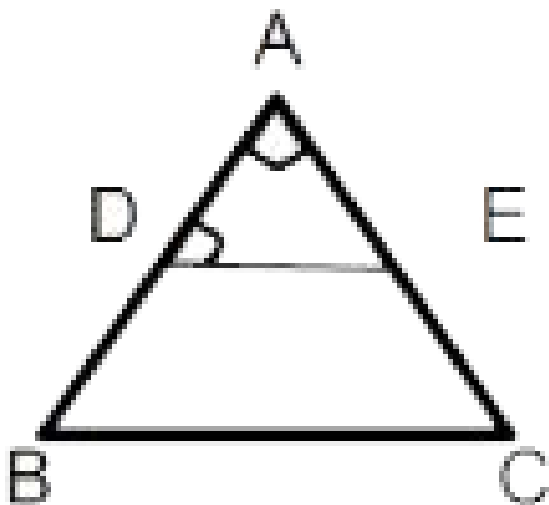**7.** In the given fig. DE||BC, $\angle ADE = 70°$ and $\angle BAC = 50°$, then angle $\angle BCA =$ ____

8. In the given figure, AD = 2cm, BD = 3 cm, AE = 3.5 cm and AC = 7 cm. Is DE parallel to BC ?
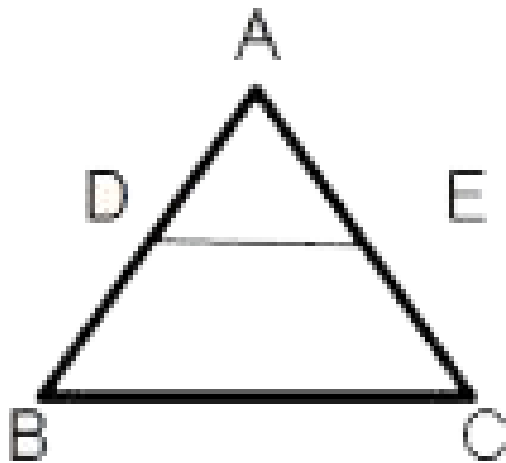
9. The cost of fencing a circular field at the rate of Rs.24 per metre is Rs. 5280. Find the radius of the field.

10. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle 30 with it. The distance between the foot of the tree to the

point where the top touches the ground is 8 m. Find the height of the tree.

11. If the perimeter and the area of a circle are numerically equal, then find the radius of the circle

12. Write the empirical relation between mean, mode and median.

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13. To divide a line segment BC internally in the ratio 3 : 5, we draw a ray BX such that $\angle$ CBX is an acute angle. What will be the minimum number of points to be located at equal distances, on ray BX?

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14. For what values of p does the pair of equations $4x + py + 8 = 0$ and $2x + 2y + 2 = 0$ has unique solution?

15. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is:

(i) red? (ii) not red?

16. A die it thrown once. What is the probability of getting a prime number?

17. A tower stands vertically on the ground. From a point on the ground, which is $15m$ away from the foot of the tower, the angle of elevation of the top of the tower is found to be $60°$. Find the height of the tower.

18. Probability of an event E + probability of the event not E is equal to ....

19.

Mathematics teacher of a school took her 10th

standard students to show Red fort. It was a part of their Educational trip. The teacher had interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2 domes at the corners which are hemispherical.7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes.

How much cloth material will be required to cover 2 big domes each of radius 2.5 metres?

A. $75m^2$

B. $78.57m^2$

C. $87.47m^2$

D. $25.8m^2$

Answer:

20.

Mathematics teacher of a school took her 10th standard students to show Red fort. It was a part of their Educational trip. The teacher had interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2

domes at the corners which are hemispherical.7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes .Write the formula to find the volume of a cylindrical pillar

A. $\pi r^2 h$

B. $\pi r l$

C. $\pi r(l + r)$

D. $2\pi r$

Answer:

21.

Mathematics teacher of a school took her 10th standard students to show Red fort. It was a part of their Educational trip. The teacher had interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find

combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2 domes at the corners which are hemispherical.7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes.

Find the lateral surface area of two pillars if height of the pillar is 7m and radius of the base is 1.4m.

A. $112.3cm^2$

B. $123.2m^2$

C. $90m^2$

D. $345.2 cm^2$

Answer:

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22.

Mathematics teacher of a school took her 10th standard students to show Red fort. It was a part of their Educational trip. The teacher had

interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2 domes at the corners which are hemispherical.7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes.

How much is the volume of a hemisphere if the radius of the base is 3.5m?

A. $85.9m^3$

B. $80m^3$

C. $90m^3$

D. $89.83m^3$

Answer:

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23.

Mathematics teacher of a school took her 10th standard students to show Red fort. It was a part of their Educational trip. The teacher had interest in history as well. She narrated the facts of Red fort to students. Then the teacher said in this monument one can find combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2

domes at the corners which are hemispherical.7 smaller domes at the centre. Flag hoisting ceremony on Independence Day takes place near these domes.

What is the ratio of sum of volumes of two hemispheres of radius 1cm each to the volume of a sphere of radius 2 cm?
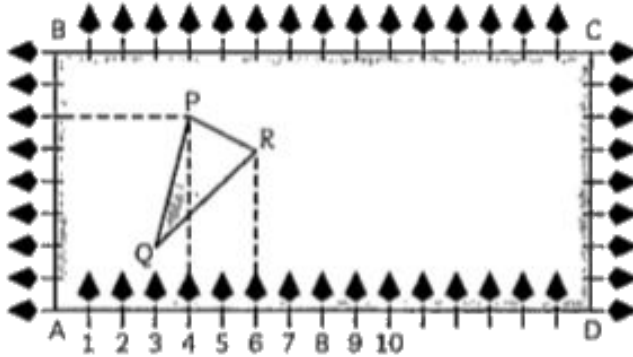
A. $1:1$

B. $1:8$

C. $8:1$

D. $1:16$

Answer:

24. Class X students of a secondary school in Krishnagar have been allotted a rectangular plot of a land for gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a traingular grassy lawn in the plot as shown in the fig. The students are to sow seeds of flowering plants on the remaining area of the

plot

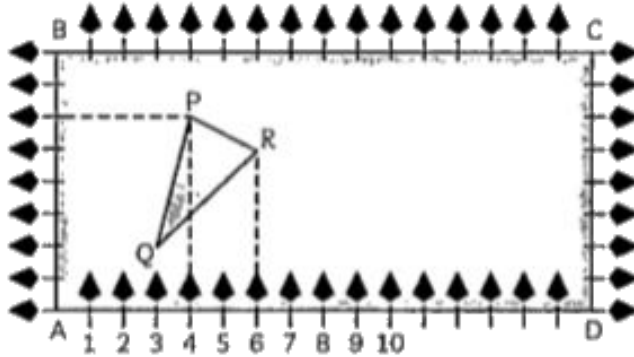considering A as the origin what are the coordinates of A

A. (0,1)

B. (1,0)

C. (0,0)

D. (-1,-1)

Answer:

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25. Class X students of a secondary school in Krishnagar have been allotted a rectangular plot of a land for gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a traingular grassy lawn in the plot as shown in the fig. The students are to sow seeds of flowering plants on the remaining area of the

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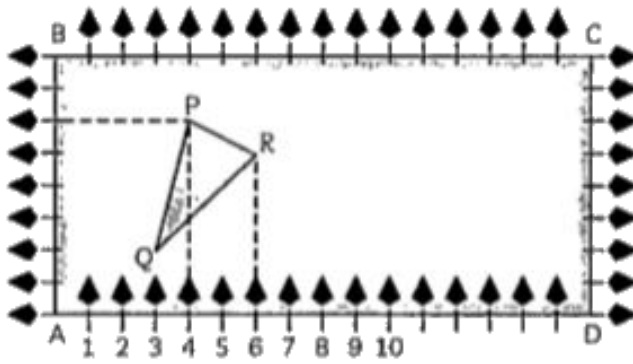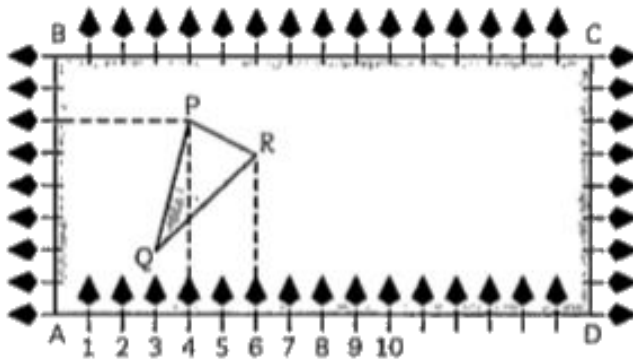What are the coordinates of P

A. (4,6)

B. (6,4)

C. (4,5)

D. (5,4)

Answer:

26. Class X students of a secondary school in Krishnagar have been allotted a rectangular plot of a land for gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a traingular grassy lawn in the plot as shown in the fig. The students are to sow seeds of flowering plants on the remaining area of the plot
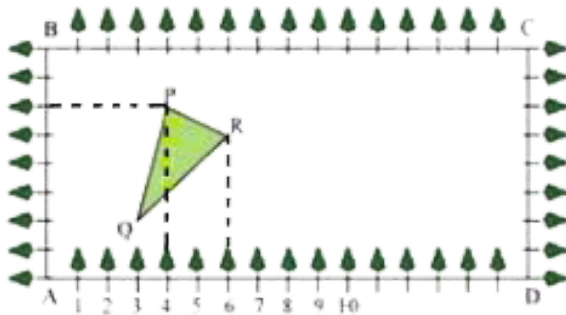
What are the coordinates of R

A. (6,5)

B. (5,6)

C. (6,0)

D. (16,1)

Answer:

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27. Class X students of a secondary school in Krishnagar have been allotted a rectangular plot of a land for gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a traingular grassy lawn in the plot as shown in the fig. The students are to sow seeds of flowering plants on the remaining area of the plot

What are the coordinates of D

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28. Class X students of a secondary school in Krishnagar have been allotted a rectangular plot of a land for gardening activity. Saplings of Gulmohar are planted on the boundary at a

distance of 1m from each other. There is a

triangular grassy lawn in the plot as shown in

the fig. The students are to sow seeds of

flowering plants on the remaining area of the

plot.

What are the coordinate of P if D is taken as

the origin?

A. (12,2)

B. (-12,6)

C. (12,3)

D. (6,10)

Answer:

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29.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

Rahul tied the sticks at what angles to each other?

A. $30°$

B. $60°$

C. $90°$

D. $60°$

Answer:

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30.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

Which is the correct similarity criteria

applicable for smaller triangles at the upper part of this kite?

A. RHS

B. SAS

C. SSA

D. AAS

Answer:

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31.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

Sides of two similar triangles are in the ratio

4:9. Corresponding medians of these triangles are in the ratio,

A. $2:3$

B. $4:9$

C. $81:16$

D. $16:81$

Answer:

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32.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

In a triangle, if square of one side is equal to

the sum of the squares of the other two sides, then the angle opposite the first side is a right angle. This theorem is called as,

A. Pythagoras theorem

B. Thales theorem

C. Converse of Thales theorem

D. converse of pythrogoras theorem

Answer:

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33.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

What is the area of the kite, formed by two perpendicular sticks of length 6 cm and 8 cm?
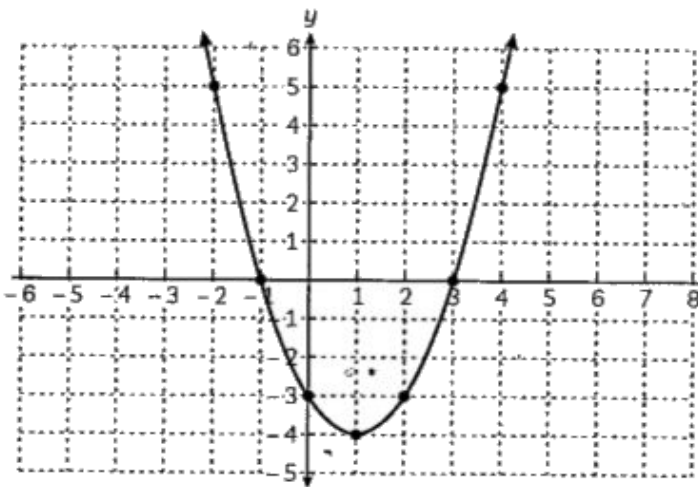
A. $48cm^2$

B. $14cm^2$

C. $24cm^2$

D. $96cm^2$

Answer:

34. Due to heavy storm an electric wire got bent as shown in the figure. It followed a mathematical shape. Answer the following questions below
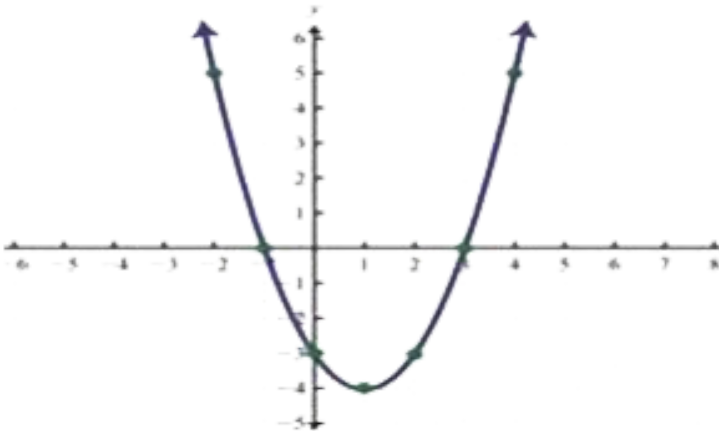
Name the shape in which the wire is bent

    A. Spiral
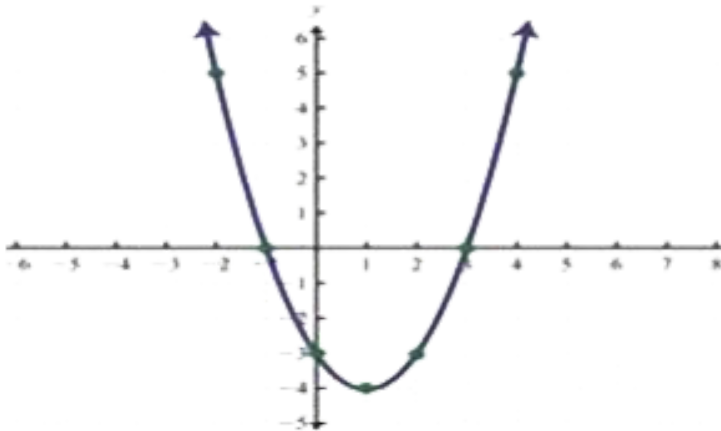
    B. Ellipse

C. Linear

D. Parabola

Answer:

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35. Due to heavy storm a electric wire got bent as shown in the figure. It followed a mathematical shape . Answer the following questions below:
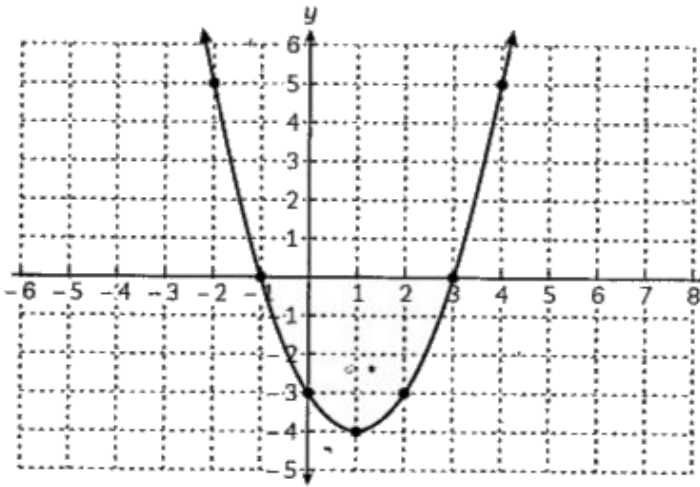
How many zeroes are there for the polynomial

A. 2

B. 3

C. 1

D. 0

Answer:

36. Due to heavy storm a electric wire got bent as shown in the figure. It followed a mathematical shape . Answer the following questions below:

The zeroes of the polynomial are

A. $-1, 5$

B. $-1, 3$

C. $3, 5$

D. $-4, 2$

Answer:

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37. Due to heavy storm an electric wire got bent as shown in the figure. It followed a mathematical shape. Answer the following

questions below

What will be the expression of the polynomial?

A. $x^2 + 2x - 3$

B. $x^2 - 2x + 3$

C. $x^2 - 2x - 3$

D. $x^2 + 2x + 3$

Answer:

38. Due to heavy storm a electric wire got bent as shown in the figure. It followed a mathematical shape . Answer the following questions below:
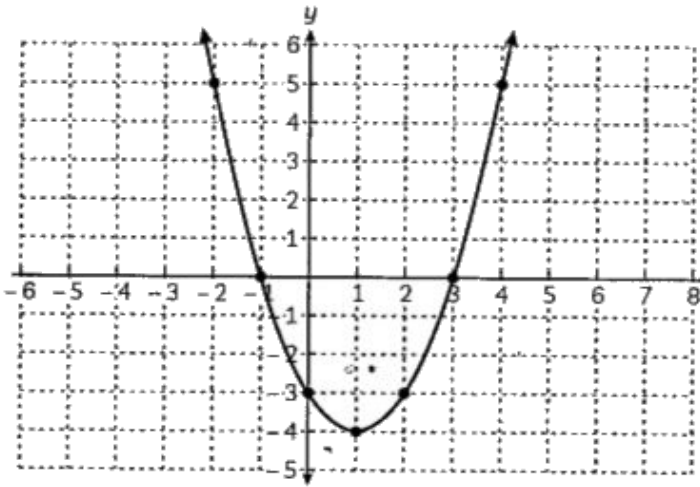
What is the value of the polynomial if x=-1

A. 6

B. − 18

C. 18

D. 0

Answer:

39. Find the coordinates of the point which divides the line segment joining the points (4, -3) and (8,5) in the ratio 3:1 internally.

40. Find a relation between x and y such that the point (x ,y) is equidistant from the points (7, 1) and (3, 5).

41. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that

$$AB + CD = AD + BC$$

42. Draw a line segment of length 7.8 cm and divide it in the ratio 5:8. Measure the two parts.

43. How many terms of the AP: 9, 17, 25, . . .

must be taken to give a sum of 636?

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44. Prove that $\sqrt{3}$ is an irrational number

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45. Two tangents TP and TQ are drawn to a circle with centre O from an external point T . Prove that $\angle PTQ = 2\angle OPQ$.

46. Meena went to a bank to withdraw Rs.2,000. She asked the cashier to give her Rs.50 and Rs.100 notes only. Meena got 25 notes in all. Find how many notes of Rs.50 and Rs.100 she received.

47. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears :

a two-digit number

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48. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at

random from the box, find the probability that it bears :

a perfect square number

49. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears :

a number divisible by 5.

50. One card is drawn from a well shuffled deck of cards . Find the probability of getting a king of red colour .

51. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting

A spade

52. One card is drawn from a well - shuffled deck of cards . Find the probability of getting the queen of diamonds.

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53. Metallic spheres of radii 6cm, 8cm and 10cm respectively are melted to form a solid sphere. Find the radius of the resulting sphere.

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54. Prove that

$$\frac{\sin A - \cos A + 1}{\sin A + \cos A - 1} = \frac{1}{\sec A - \tan A}$$

55. A motor boat whose speed in still water is 18 km/h, takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

56. Find two consecutive odd positive integers, sum of whose squares is 290

57. The angles of depression of the top and bottom of a 8m tall building from the top of a multi storied building are 30º and 45º, respectively. Find the height of the multi storied building and the distance between the two buildings.

58. A 1.2 m tall girl spots a ballon moving with the wind in a horizontal line at a height of 88.2 m from a ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60^0. After some time, the angle of elevation reduces to 30^0. Find the distance travelled by the balloon during the interval.

59. The pth, q^{th} and r^{th} terms of an A.P. are a, b, c, respectively. Show that

$$(q - r)a + (r - p)b + (p - q)c = 0.$$

60. A survey regarding the heights in (cm) of 51 girls of class X of a school was conducted and the following data was obtained. Find the median height and the mean using the

formulae

Height (in cm)	Number of Girls
Less than 140	4
Less than 145	11
Less than 150	29
Less than 155	40
Less than 160	46
Less than 165	51

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61. What is the HCF of the smallest prime number and the smallest composite number?

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62. Write a quadratic equation, sum of whose roots is $-3\sqrt{2}$ and their product is 4.

63. In an A.P. if $S_n = 5n^2 - 3n$ find the A.P.

OR

From the adjoining figure of a rectangle, find the values of x ond y.
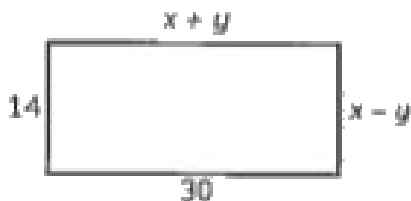
64. Find a point which divides the join of A (-3, 4) and B (9,6) internally in the ratio 3: 2.

65. If the distance between the points P(2, - 3) and Q (10, y) is 10 units, then find the value of 'y'.

66. Draw a line segment of length 7 cm and divide it in the ratio 2:3.

67. What number should be added to the polynomial, $x^2 + 7x - 35$, so that 3 is the zero of the polynomial?

68. For what value of k, do the equations

$$3x - y + 8 = 0 \quad \text{and} \quad 6x - ky = -16$$

represent coincident lines ?

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69. The 4th term from the end of an AP -11, -8, -5, ..., 49 is

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70. If the curved surface ared of a sphere is 4π sq m. then find the diameter of the sphere.

71. What is surface area of the resultant cuboid, obtained on joining 2 identical cubes each of edge 2 cm?

72. If $\triangle ABC$ is right angled at C, then find the value of $\cos (A + B)$

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73. A letter is drawn at random from the letters of the word ERROR. What is probability that the drawn latter is R ?

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74. If cos (A+B) =0 and sin (A-B) = $\frac{\sqrt{3}}{2}$ then calculate the value of A.

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75. In triangle ABC, right-angled at B. if $\tan A = \frac{1}{\sqrt{3}}$,find the value of: $\sin A \cos C + \cos A \sin C$

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76. If a fair dice is thrown once, find the probability of getting a number which is even as well as prime.

77. In the given figure, PS is the bisector of $\angle QPR$. If PO = 15, PR = 7, QS = 3 + x and SR = x

- 3, find the value of x.

P

15   7

Q
3 + x   S   x − 3   R
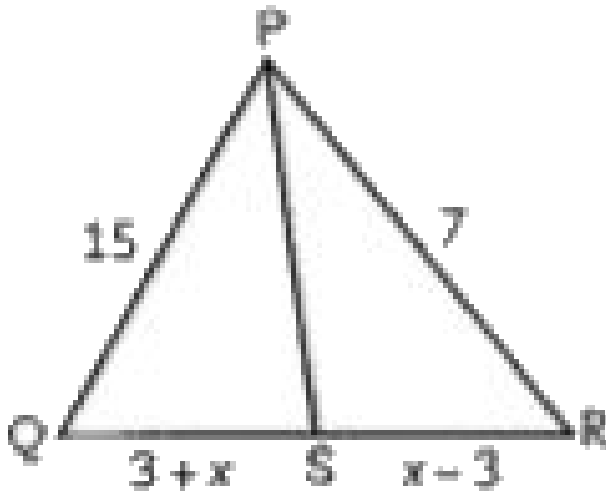
78. If in two triangles ABC and PQR, $\dfrac{AB}{PQ} = \dfrac{BC}{RP}$, then for the two triangles to be

similar, which of the following condition is necessary?

79. If 6th term and 8th term of an A.P. are 12 and 22 respectively, then find its 2nd term.

80. Determine zeros of polynomial p(x) $= x^3 - 7x$.

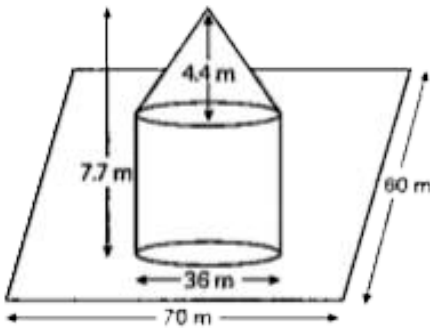**81.** Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

Bholeram Tents is given a contract by the municipal corporation of Budaun (Uttar Pradesh), India to setup a mega function pandal (tent). The architect has designed a tent of height 7.7 m in the form of a right circular cylinder of diameter 36 m and height

4.4 m surmounted by a right circular cone.

This tent is setup in a rectangular park of dimensions 70 m × 60 m as shown below.

The tent is made of canvas. (Take $\pi = 3.14$)
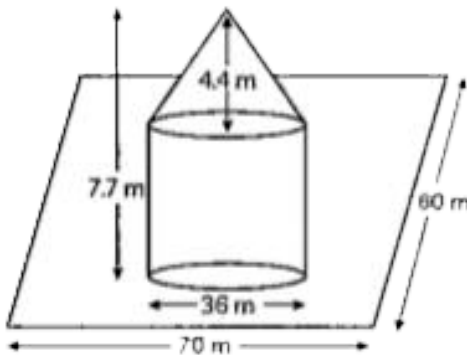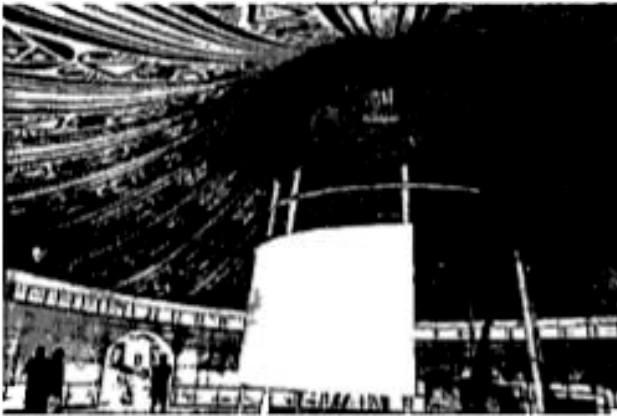
For the workers to finalise the purchase of material, the height of the conical part is:

A. 2.3 m

B. 6.3 m
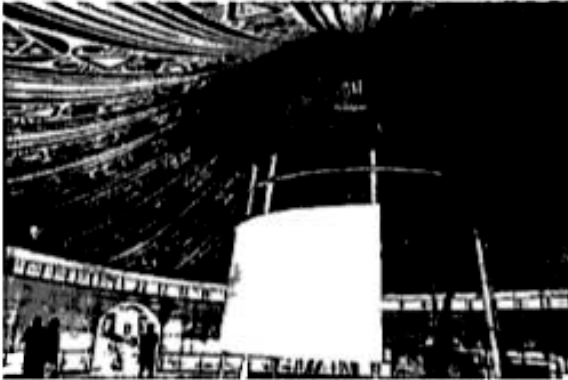
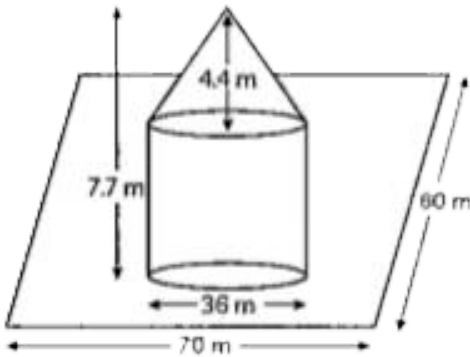C. 3.3 m

D. 12.1 m

Answer:

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82. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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dimensions 70 m × 60 m as shown below.

The tent is made of canvas. (Take $\pi = 3.14$)

The slant height of the conical part is:
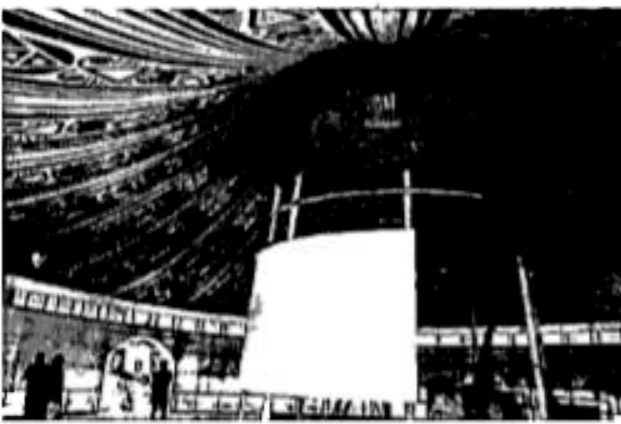
A. 18.3cm

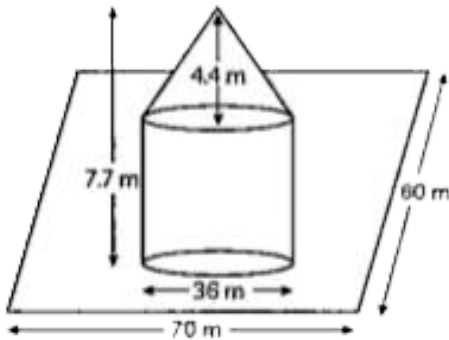B. 18.7 cm

C. 19.1 cm

D. 19.4cm

Answer:

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83. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

Bholeram Tents is given a contract by the

municipal corporation of Budaun (Uttar Pradesh), India to setup a mega function pandal (tent). The architect has designed a tent of height 7.7 m in the form of a right circular cylinder of diameter 36 m and height 4.4 m surmounted by a right circular cone. This tent is setup in a rectangular park of dimensions 70 m × 60 m as shown below. The tent is made of canvas. (Take $\pi = 3.14$)

To purchase the canvas, the area of the canvas

to be used approx in making the tent, is:

A. 1353 sq cm
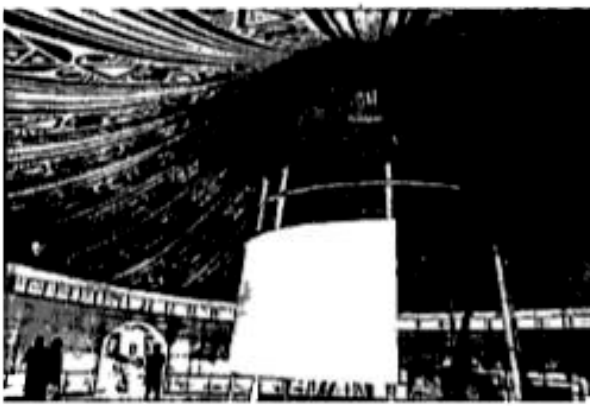
B. 1386 sq m

C. 1406 sq m

D. 1533 sq m

Answer:

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84. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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4.4 m

7.7 m

60 m

← 36 m →

70 m

The cost of canvas at ₹ 4.50, sq m is:

A. Rs 6327

B. Rs 6237

C. Rs 6898.50

D. Rs 6088.50

Answer:

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85. Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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Pradesh), India to setup a mega function pandal (tent). The architect has designed a tent of height 7.7 m in the form of a right circular cylinder of diameter 36 m and height 4.4 m surmounted by a right circular cone. This tent is setup in a rectangular park of dimensions 70 m × 60 m as shown below. The tent is made of canvas. (Take $\pi = 3.14$)
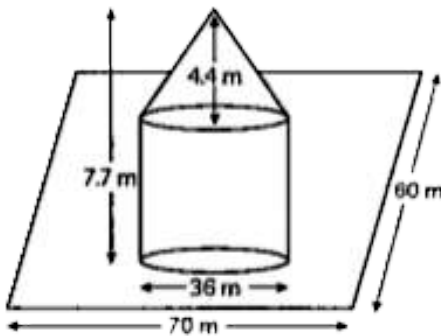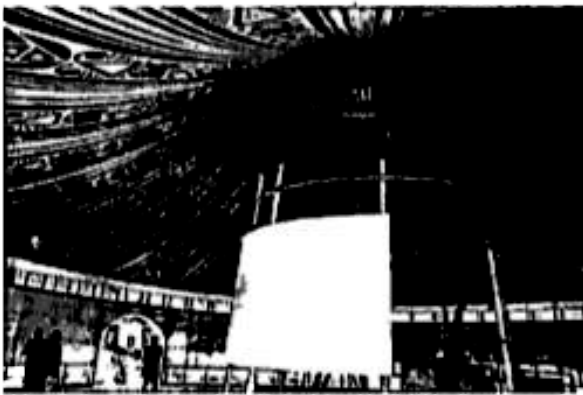
The area of the rectangular park outside the tent is:

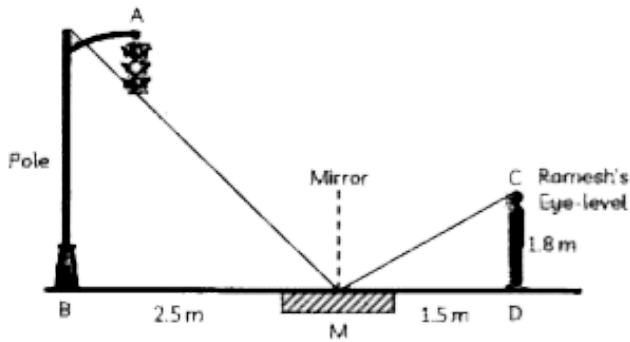A. 1883 sq m

B. 2864 sq m

C. 3182 sq m

D. 4200 sq m

Answer:

86. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fired on it). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of

Ramesh and the pole from the mirror are 1.5 m

and 2.5 m respectively.

The two similar triangles shown in the figure

are:

A. $\triangle ABM$, $\triangle MCD$

B. $\triangle AMB$, $tra \in g \leq CDM$

C. $\triangle ABM$, $\triangle CMD$

D. $\triangle ABM$, $\triangle MDC$

Answer:

87. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fired on it). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.
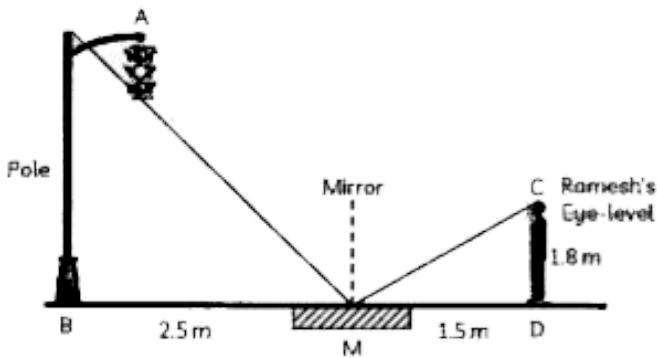
Which criterion of similarity is applicable to similar triangles?
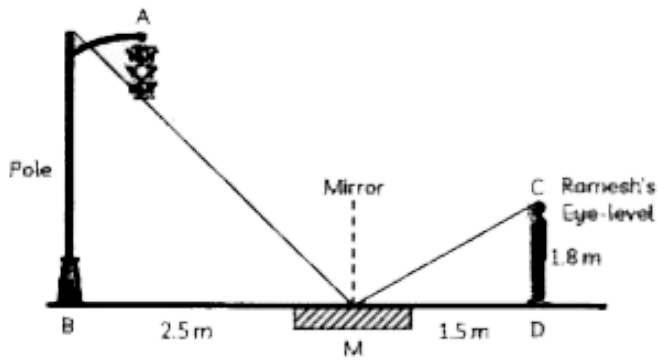
A. SSA

B. ASA

C. SSS

D. AAA

Answer:

88. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fired on it). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.
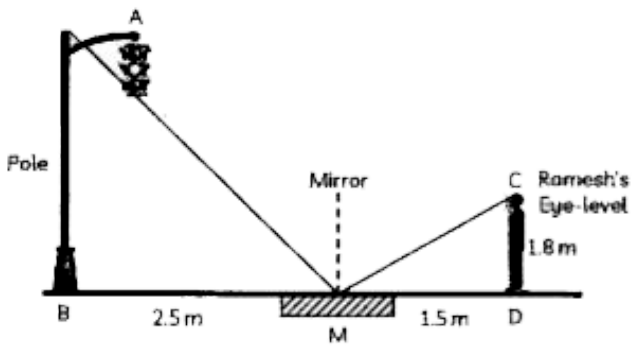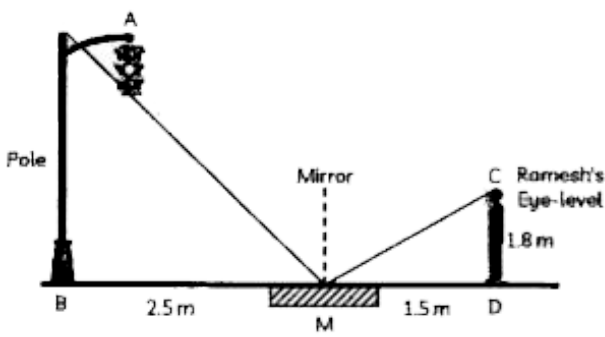
The height of the pole is:

A. 3 metres

B. 2.8 metres

C. 3.2 metres

D. 3.8 metres

Answer:

▶ Watch Video Solution

89. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fired on it). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.

Pole | B | 2.5 m | Mirror | M | 1.5 m | D | C Ramesh's Eye-level | 1.8 m | A

If Ramesh's eye level is 1.2 m above the ground, then the height of the pole is:

A. 3 metres

B. 2.6 metres

C. 2.2 metres

D. 2 metres

Answer:

90. Ramesh places a mirror on level ground to determine the height of a pole (with traffic light fired on it). He stands at a certain distance so that he can see the top of the pole reflected from the mirror. Ramesh's eye level is 1.8 m above the ground. The distance of Ramesh and the pole from the mirror are 1.5 m and 2.5 m respectively.

If the distance of Ramesh and the pole from the mirror are 2.5 m and 1.5 m respectively, then the height of the pole is:

A. 3 metres
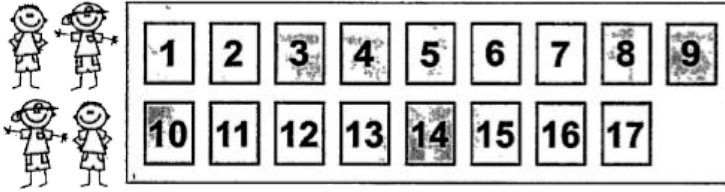
B. 1.2 metre

C. 1.8 metre

D. 1.08 metre

Answer:

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91. 4 boys are having a night in and one of the boy's mother decides to play a game. 17 cards numbered 1, 2, 3_17 are put in a box and mixed thoroughly.

The mother asks each boy to draw a card and after each draw, the card is replaced back in the box. She shows some magic tricks and at the end, decides to test their mathematical

skills.

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	

The probability of drawing an odd number card in the first draw by the first boy is:

A. $\dfrac{11}{17}$

B. $\dfrac{10}{17}$

C. $\dfrac{9}{17}$

D. $\dfrac{8}{17}$

Answer:

92. 4 boys are having a night in and one of the boy's mother decides to play a game. 17 cards numbered 1, 2, 3 . 17 are put in a box and mixed thoroughly. The mother asks each boy to draw a card and after each draw, the card is replaced back in the.box. She shows some magic tricks and at the end, decides to test their mathematical skills.
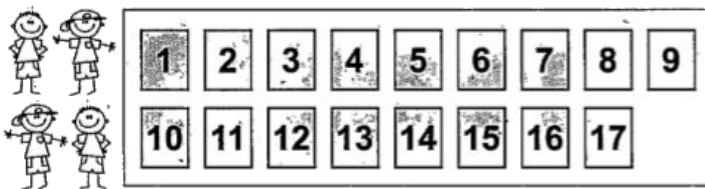
The probability of drawing a prime number card in the second draw by the second boy is

A. $\dfrac{3}{16}$

B. $\dfrac{7}{17}$

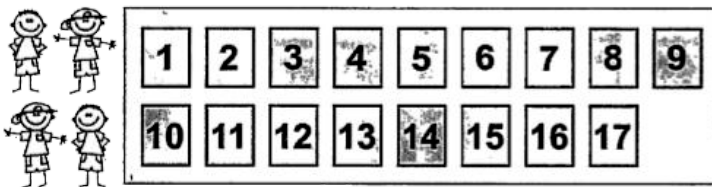C. $\dfrac{9}{17}$

D. $\dfrac{8}{15}$

Answer:

▶ **Watch Video Solution**

93. 4 boys are having a night in and one of the boy's mother decides to play a game. 17 cards numbered 1, 2, 3_17 are put in a box and mixed thoroughly.

The mother asks each boy to draw a card and after each draw, the card is replaced back in the box. She shows some magic tricks and at the end, decides to test their mathematical skills.

If the card is not replaced after the second

draw, the probability of drawing a card bearing a multiple of 3 greater than 4 in the third draw by the third boy is:

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

B. $\dfrac{1}{3}$

C. $\dfrac{2}{3}$

D. $\dfrac{5}{6}$

Answer:

▶ Watch Video Solution

94. Using prime factorisation, find the LCM of 90 and 120.

95. Using the quadratic formula, find the roots of the quadratic equation: $x^2 + x - 12 = 0$.

96. If tan A $= \dfrac{7}{24}$ find the value of sin A cos A.

▶

97. Prove that

$$\sin^2 A + \sin^2 A \tan^2 A = \tan^2 A.$$

98. If the centroid of $\triangle ABC$ having vertices A(a, b), B(b, c) and C(c, a) is the origin, then find the value of (a+b+c).

99. The perimeter of a sheet of paper in the shape of a quadrant of a circle is 75 cm. Find its area

100. If $\sin\theta + \cos\theta = \sqrt{3},$ then what is $\tan\theta + \cot\theta$ equal to ?

101. Evaluate : $\dfrac{\sin 30^\circ + \tan 45^\circ - \cos ec60^\circ}{\sec 30^\circ + \cos 60^\circ + \cot 45^\circ}$
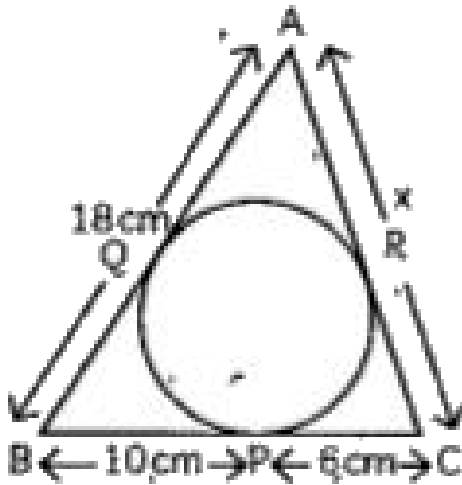
▶ **Watch Video Solution**

102. If the points $A(1, \ -2), B(2, 3), C(a, 2)$ and $D(-4, \ -3)$ forms a parallelogram, find the value of 'a'.

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103. In the figure, all three sides of a triangle ABC touch the circle at points P, Q and R. Find the value of x.

104. The product of the LCM and HCF of two numbers is 24.The difference of the two numbers is 2.Find the numbers?

105. How many spherical lead shots each 4.2 cm in diameter can be obtained from a rectangular solid of lead with dimensions 66cm, 42cm, 21cm. $\left(use\pi = \frac{22}{7} \right).$

106. The first term of an A.P. is 5, the last term is 45 and the sum is 400. Find the number of terms and the common difference.

107. A tree is broken by the wind. The top of that tree struck the ground at an angle of $30°$ and at a distance of 30 m from the root. Find the height of the whole tree. ($\sqrt{3}$ = 1.73)

108. Theorem 6.8 : In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

109. Without performing actual division, check if $\dfrac{17}{30}$ is a terminating decimal.

110. Find the value of x so that the distance between the points (-3,4) and (x,-4) is 10 units.

111. The veticles of an equilateral trianlge ABC are (0,0)(0,y) and (3, $\sqrt{3}$), then find the value of y.

112. Define the mode of a frequency distribution and give the formula used in computing the mode of a grouped frequency distribution.

113. A right triangle has hypotenuse of length p cm and one side of length q cm . If p-q = 1, find the length of the third side of the triangle.

A.

B.

C.

D.

Answer:

▶ **Watch Video Solution**

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114. If a hexgon ABCDEF circumscribes a circle

then show that AB+CD+EF =BC+DE+FA,

115. Three identical cubes each of volume 27 cu cm are joined together end to end. What are the dimesions of the resulting cuboid?

116. If a chord of a circle of radius 'r' subtends a right angle at the centre of the circle, then determine the area of the correspondin segment?

117. What is the volume of the material in a spherical shell with inner radius 'r' and outer radius 'R'?

118. If $\tan \theta = 1$, then calculate the value of $\sec \theta + \cos ec\theta$.

119. If `3tan^2 x = 1(0^@

120. What is the positive real root of

$$64x^2 - 1 = 0?$$

121. The base radii of two cylinders are in the ratio 2 : 3 and their heights are in the ratio 5:3. The ratio of their volumes is :

122. If α and β be the zeros of the quadratic polynomial $2x^2 + 5x + 1$ then calculate the value of $\alpha + \beta + \alpha\beta$?

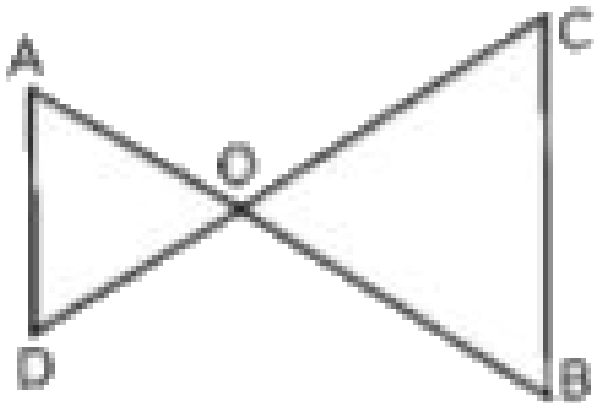**123.** What is middle value of a class interval which lies between true upper limit and true lower limit called?

▶ **Watch Video Solution**

124. An integer is chosen at random between 1 and 100 . Find the probability that chosen number is divisible by 10.

▶ **Watch Video Solution**

125. In the figure.If $\dfrac{OA}{OD} = \dfrac{OC}{OB}$, then

which pair of angle are equal?

> ▶ Watch Video Solution

126. Check if 0.2 is a root of the equatin $x^2 - 0.4 = 0.$

> ▶ Watch Video Solution

127. If 6 times the 6th term of the A.P is equal to 9 times the 9th term, then find its 15th term.

▶ **Watch Video Solution**

128. Find the soluton of the following pair of equation: x-3y = 2, 3x-y = 14

▶ **Watch Video Solution**

129. The chord of a circle of radius 8 cm subtends a right angle at its centre. Find the length of the chord.

▶ **Watch Video Solution**

130. Formula one Portugese Grand Prix technical team at the Algarve International Circuit are analysing last year data of drives's performance to provide valuable inference to commentators on how the drives can improve

this year.

	Support staff	Lap errors		Support staff	Lap errors
Ferrari	36	41 (13%)	Force India	36	36 (11%)
Mercedes	36	61 (19%)	Toro Rosso	36	23 (7%)
Red Bull Racing	36	52 (16%)	Renault	36	16 (5%)
McLaren	36	31 (9%)	Sauber	36	13 (4%)
Williams	36	33 (10%)	Haas		19 (6%)

The length of time taken by 80 drives to complete a journey is given in the table below:

Times (in minutes)	70-80	80-90	90-100	100-110	110-120	120-130
Number of drivers	4	10	14	20	24	8

In which interval does the median of the distribution lie?

A. 80-90

B. 90-100

C. 100-110

D. 110-120

Answer:

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131. Google maps cartography team is working on improving the scalability quality of maps when you use the app on your phones to zoom in using 4 fingers. They are using a proprietary tool called "MapMaker' to figure

out scalability factors. A mathematical model is created for a type of object (below cross-section) to test its scalability on maps app.

In the diagram, $AC = 8cm$, $CE = 4cm$ and the area of the triangle BEC is 4.2 sq cm. Another enlargement with centre E, maps $\triangle EBC$ onto $\triangle EFA$, $BC = 3.6cm$
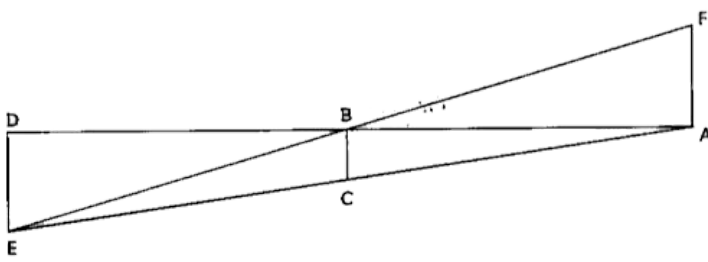
The area of $\triangle ABC$ is:

A. 4.2 sq cm

B. 6.3 sq cm

C. 8.4 sq cm

D. 12.6 sq cm

Answer:

▶ Watch Video Solution

132. Find the HCF and the LCM of 72 and 120, using prime factorisation method.

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133. Write a pair of equations in variables x and y which is consistent with

(A) unique solution

(B) infinitely many solution

▶ **Watch Video Solution**

134. Write a pair of equations in variables x and y which is consistent with

(A) unique solution

(B) infinitely many solution

▶ **Watch Video Solution**

135. In an AP, if a = 1, a_n= 20 and S_n = 399, then n is equal to

▶ **Watch Video Solution**

136. The verticles of an equilateral triangle ABC are (0, 0), (0, y) and $\left(3, \sqrt{3}\right)$, then find the value of y
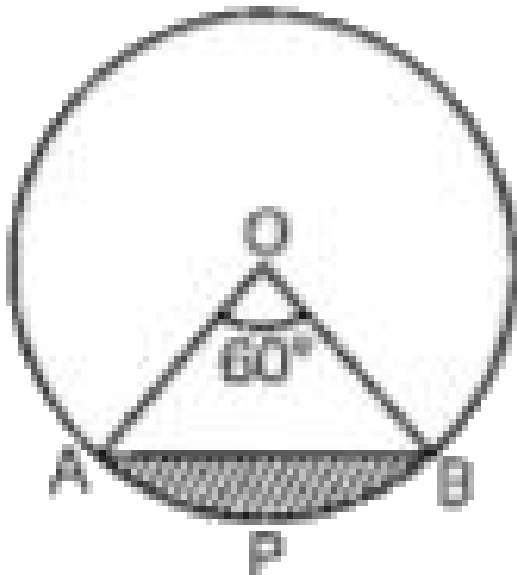
137. If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, then prove that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$

138. In the figure, chord AB subtends an angle of $60°°$ at the centre of the circle of radius 3.5 cm. Find the (a) length of the arc APB (b) the area of the sector AOB (C) area of the minor segment (Shaded region) (use$\sqrt{3} = 1.73$)

139. If $\sin\theta + \cos\theta = p$ and $\sec\theta + \mathrm{cosec}\theta = q,$ then prove that $q(p^2 - 1) = 2p.$

140. 7. Let A $(4, 2)$ B$(6., 5)$ and C$(1., 4)$. be the vertices of $\triangle ABC$. (1) The median from A meets BC at D. Find the coordinates of the point D. (2) the coordinates of the point P on AD such that $AP:PD = 2:1.$ (3) Find the

coordinates of points Q and R on medians BE and CF respectively such that $BQ:QE = 2:1$ and $CR:RF = 2:1$. (4) what do yo observe?

141. One card is drawn from a pack of 52 cards , each of the 52 cards being equally likely to be drawn. Find the probability that the card drawn is black .

142. One card is drawn from a pack of 52 cards

, each of the 52 cards being equally likely to be

drawn. Find the probability that

the card drawn is either black or a queen .

143. One card is drawn from a pack of 52 cards

, each of the 52 cards being equally likely to be

drawn. Find the probability that

the card drawn is black and a queen .

144. In figure ABC and DBC are two triangles on the same base BC. If AD intersects BC at O, show that $\dfrac{ar(ABC)}{ar(DBC)} = \dfrac{AO}{DO}$.

145. Prove that the line segments joining the mid-points of the sides of a triangle from four triangles, each of which is similar to the original triangle.

146. Verify that 2,1,1 are the zeros of the polynomial $x^3 - 4x^2 + 5x - 2$. Also, verify the relationship between the zeroes and the coefficients

147. If two concentric circles are of radii 5 cm and 3 cm, then the length of the chord of the

larger circle which touches the smaller circle is-

यदि दो संकंद्री वृत्तों की त्रिज्याएं 5 सेमी तथा 3 सेमी. हों, तो उनमें बड़े वृत्त की उस जीवा की लम्बाई कितनी होगी, जो छोटे वृत्त को स्पर्श करती है?

 Watch Video Solution

148. If P is the point $(-\cos\theta, \sin\theta)$, find the length of OP, where O is the origin.

 Watch Video Solution

149. Find the smallest 4-digit number, which can be divided exactly by 24 and 36.

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150. ABC is an isoscles triangle, right-angled at C. Show that $AB^2 = 2AC^2$.

▶ **Watch Video Solution**

151. State the SAS cirterion of similarity of triangles.

152. If a metalic cube edge 1 cm is drawn into a wire of diameter 3.2 mm, then find the length of the wire.

153. If a cuibcal block of side 7 cm is surmounted by a hemisphere, then find the gretest diameter that a hemisphere can have.

154. If the nth term of an A.P. is $\dfrac{3+n}{4}$, then find the common difference of A.P.

155. If 3 sec A - 2 cos B = $\sqrt{3}$ and $B = 30°$, then find the value of A.

156. If $\sin\theta + \sin^2\theta = 1$, then the value of $\cos^2\theta + \cos^4\theta$ is equal to:

यदि $\sin\theta + \sin^2\theta = 1$ तो $\cos^2\theta + \cos^4\theta$ का मान किसके बराबर है?

157. The perimeter of a rectangle is 82 m and its area is 400 m^2. What is the breadth of the rectangle ?

158. What is the value of k for which the system of equations $x + 2y - 3 = 0$ and $5x + ky + 7 = 0$ has no solution ?

159. Solve for x: $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

160. Find the distance between the points (0,5) and (-5,0).

161. Which term of the A.P. 21,42,63, 84,....is 210?

162. Solve for x and y: x-y = 3 and x+2y = 6

163. Write a quadratic equation whose zeroes are -7 and 5.

164. If $\sin\theta = \dfrac{12}{13}$, find the value of :

$$\frac{\sin^2\theta - \cos^2\theta}{2\sin\theta\cos t\theta} - \frac{1}{\tan^2\theta}$$

165. Find the area and perimeter of a sheet of a paper which is a sector of a circle of radius 21 cm central angle 45°.

166. If the perimeter of a circle and a square are equal, then what is the ratio of the area of the circle to that of the square ?

167. The two opposite verticles of a square (-1,2) and (3,2) . Find the coordinates of the other two vertices.

168. Find a relationship between x and y such that the point (x,y) is equidistant from the points (2,5) and (-1,4).

169. Find the greatest number which when divides 245 and 1029 leaves remainder 5 in each case.

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170. Solve for x: $x^4 - 20x^2 + 64 = 0$.

▶ **Watch Video Solution**

171. Solve for x and y : = $\dfrac{3a}{x} - \dfrac{2b}{y} = -5$ and $\dfrac{a}{x} + \dfrac{3b}{y} = 2, x, y \neq 0.$

172. Prove that the area of an equilateral triangle descriped on a side of a right-angles isosceles triangle is half the area of the equilateral triangle, described on the hypotenuse.

173. If α and β are zeros of a quadratic polynomial $4x^2 + 4x + 1$, then find the quadratic polynomial whose zeros are $\alpha^2 + \beta^2$ and $2\alpha\beta$.

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174. A farmer conects a pipe of internal diameter 20 cm from a canal into cylindrical tank which is 0 m in diameter and 2 m deep. If the water flows through the pipe at the rate of

3 km hour, in how much time will the tank be filled completely?

175. How many terms of the A.P. 9,17,25,..... Must be taken to give a sum of 636?

176. 5 books and 7 pens together cost Rs 79, whereas 7 books and 5 pens together cost

Rs77. Find the toal cost of 1 book and 2 pens.

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177. The length of a rectangular plot is greater than thrice its breadth by 2m. If the area of the plot is $120m^2$. Find the dimensions of the plot.

▶ **Watch Video Solution**

178. A tower is 50, high. Its shadow is x metres shorter, when the sun's altitude is $45°$ than when it is $30°$. Find x correct to the nearest cm.

179. If xy=180 and HCF(x,y)=3, then find the LCM(x,y).

The decimal representation of $\dfrac{14587}{2^1 \times 5^4}$ will terminate after how many places?

180. The decimal representation of $\dfrac{14587}{2^1 \times 5^4}$ will terminate after how many decimal places?

181. If the sum of the zeroes of the quadratic polynomial $3x^2 - kx + 6$ is 3 ,then find the value of K.

182. For what value of k, the pair of linear equations 3x+y=3 and 6x+ky=8 does not have solution.

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183. If 3 chairs and 1 table costs Rs. 1500 and 6 chairs and 1 table costs Rs.2400. Form linear equations to represent this situation.

> ▶ **Watch Video Solution**

184. Which term of the A.P. 27, 24, 21,.....is zero?

185. In an AP, if d = -4, n = 7 and a_n = 4, then a is

equal to

186. If the equation $9x^2 + 6kx + 4 = 0$ has

equal roots then k=?

187. Find the roots of the equation x^2+7x+10=0

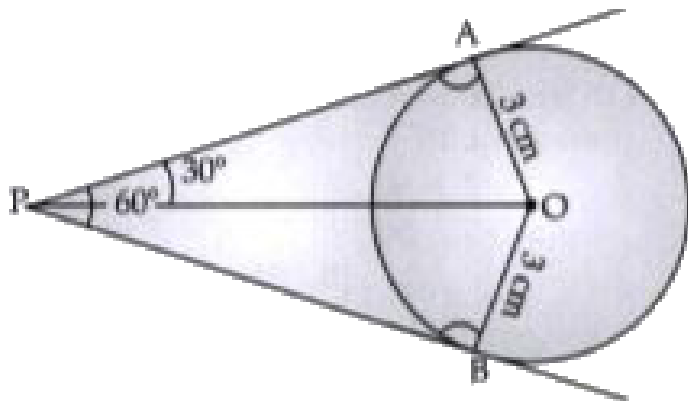**188.** For what value(s) of 'a' quadratic equation

$30ax^2 - 6x + 1 = 0$ has no real roots?

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

190. PQ is a tangent to a circle with centre O at the point P. If $\triangle OPQ$ is an isoceless
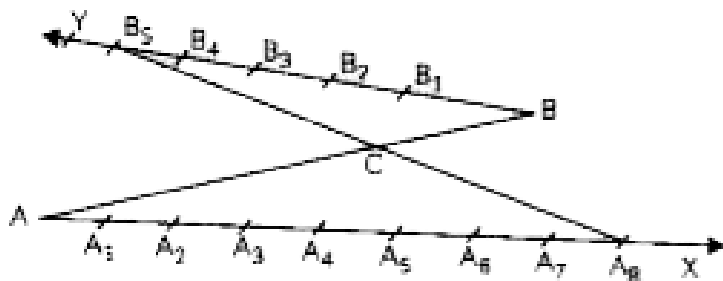
triangle, then $\angle OQP$ is equal to

191. In the $\triangle ABC$, D and E are points on side AB and AC respectively such that DE II BC. If AE=2cm, AD=3cm and BD=4.5cm, then find CE.

192. In the figure, if $B_1, B_2, B_3,$ and $A_1, A_2, A_3, \ldots$ have been marked at equal

distances. In what ratio C divides AB?

193. $\sin A + \cos B = 1$, $A = 30°$ and B is an acute angle ,then find the value of B.

194. If $x = 2\sin^2 \theta$ and $y = 2\cos^2 \theta + 1$,then find $x + y$

▶ Watch Video Solution

195. In a circle of diameter 42 cm, if an arc subtends an angle of $60°$ at the centre where $\pi = \dfrac{22}{7}$ then what will be the length of arc?

▶ Watch Video Solution

196. Twelve solid spheres of the same size are made by melting a solid metallic cylinder of base diameter 2 cm height 16 cm . The diameter of each sphere is .

▶ **Watch Video Solution**

197. Find the probability of getting a double in a single throw of a pair of dice .

▶ **Watch Video Solution**

198. Find the probability of getting a black queen when a card is drawn at random from a well-shuffled pack of 52 cards
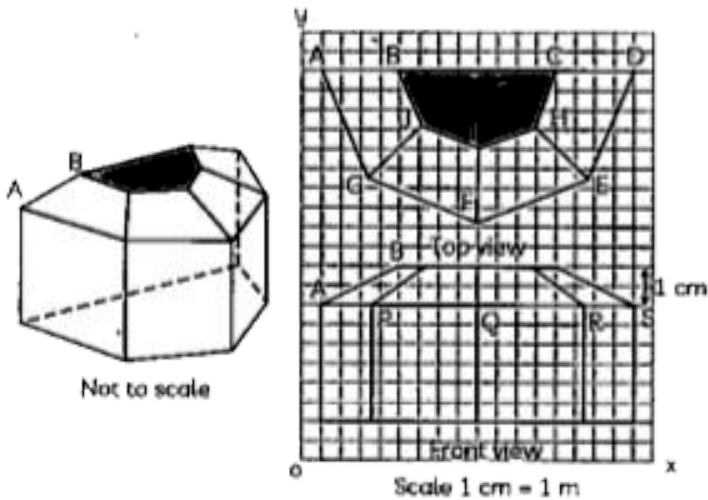
199. SUN ROOM

The diagrams show the plans for a sun room. It will be built onto the wall of a house. The four walls of the sunroom are square clear glass panels. The roof is made using four clear glass panels, trapezium in shape, all the same

size

One tinted glass panel, half a regular octagon in shape

Not to scale

Top View

Front View

Scale 1 cm = 1 m

1 cm

Refer to Top View

Find the mid-point of the segment joining the points J (6, 17) and I (9, 16).

A. $\left(\dfrac{33}{2}, \dfrac{15}{2} \right)$

B. $\left(\dfrac{3}{2}, \dfrac{1}{2}\right)$

C. $\left(\dfrac{15}{2}, \dfrac{33}{2}\right)$

D. $\left(\dfrac{1}{2}, \dfrac{3}{2}\right)$

Answer:

▶ **Watch Video Solution**
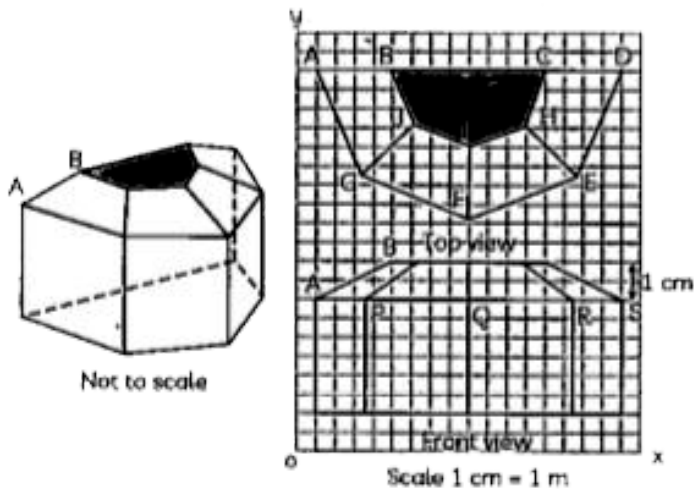
200. Case Study based-1

SUN ROOM

The diagrams show the plans for a sun room.

It will be built onto the wall of a house. The

four walls of the sunroom are square clear

glass panels. The roof is made using four clear

glass panels, trapezium in shape, all the same

size

One tinted glass panel, half a regular octagon

in shape

Not to scale

Scale 1 cm = 1 m

Refer to Top View

The distance of the point P from the y-axis is

A. 4

B. 15

C. 19

D. 25

Answer:

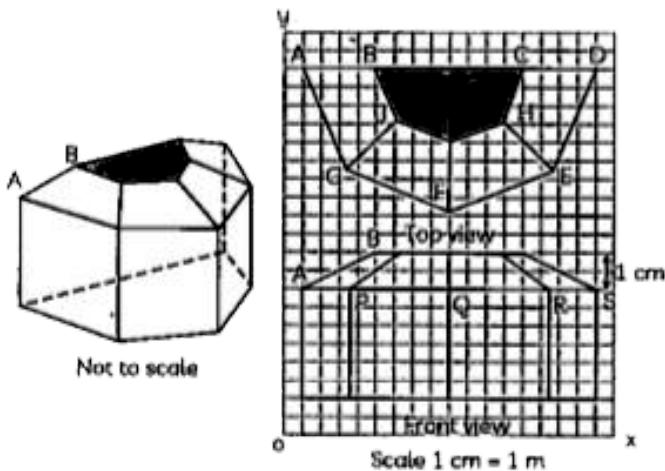▶ **Watch Video Solution**

201. SUN ROOM

The diagrams show the plans for a sun room.

It will be built onto the wall of a house. The

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size

One tinted glass panel, half a regular octagon

in shape

Not to scale

Top view

Front view

Scale 1 cm = 1 m

1 cm

Refer to Top View

If a point (x, y) is equidistant from the Q(9, 8) and S(17, 8), then

A. x + y = 13

B. x - 13 = 0

C. y - 13 = 0

D. x - y =13

Answer:

202. A model of a boat is made on the scale of 1:4. The model is 120cm long. The full size of the boat has a width of 60cm. What is the width of the scale model?

(i) 20 cm

(ii) 25 cm

(iii) 15 cm

(iv)240 cm

A. 20 cm

B. 25 cm

C. 15 cm

D. 240 cm

Answer:

▶ **Watch Video Solution**

203. The shadow of a 5-m-long stick is 2m long. At the same time, the length of the shadow of a $12.5m$ high tree is

A. 3 m

B. 3.5 m

C. 4.5 m

D. 5 m

Answer:

▶ **Watch Video Solution**

204. Below you see a student's mathematical model of a farmhouse roof with measurements. The attic floor, ABCD in the

model, is a square. The beams that support

the roof are the edges of a rectangular prism,

EFGHKLMN. E is the middle of AT, F is the

middle of BT, G is the middle of CT, and H is the

middle of DT. All the edges of the pyramid in

the model have length of 12 m.
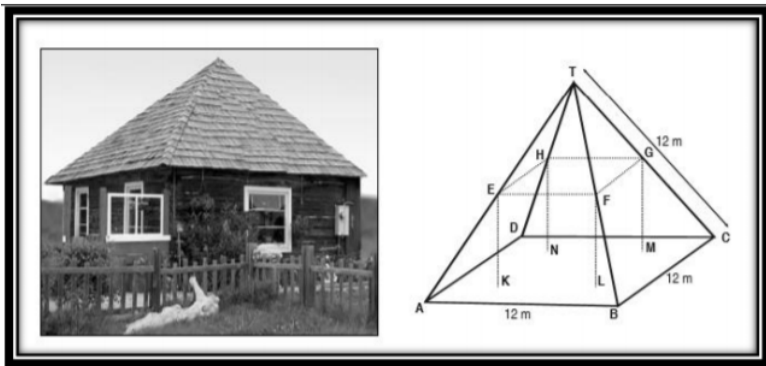
What is the length of EF, where EF is one of

the horizontal edges of the block?

(i)24m

(ii)3m

(iii)6m

(iv)10m

A. 24m

B. 3 m

C. 6 m

D. 10m

Answer:

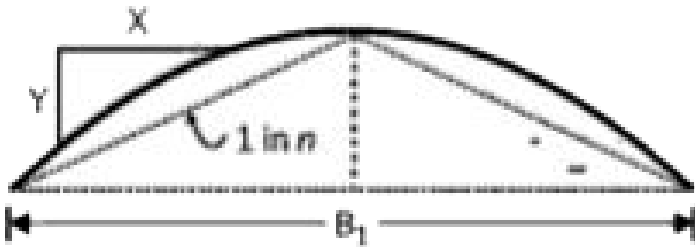**205.** Case Study Based- 3

Applications of Parabolas-Highway Overpasses/Underpasses A highway underpass is parabolic in shape.
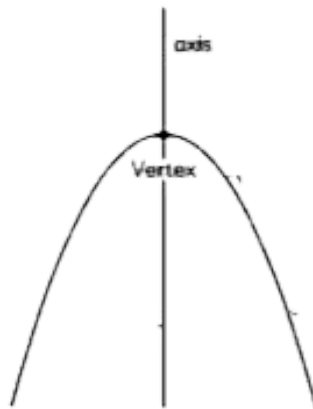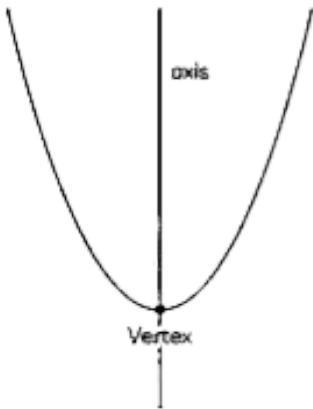

Parabola

A parabola is the graph that results from

$$p(x) = ax^2 + bx + c$$

Parabolas are symmetric about a vertical line known as the Axis of Symmetry. The Axis of Symmetry runs through the maximum or minimum point of the parabola which is called the Vertex.

If the highway overpass is represented by $x^2 - 2x - 8$. Then its zeroes are

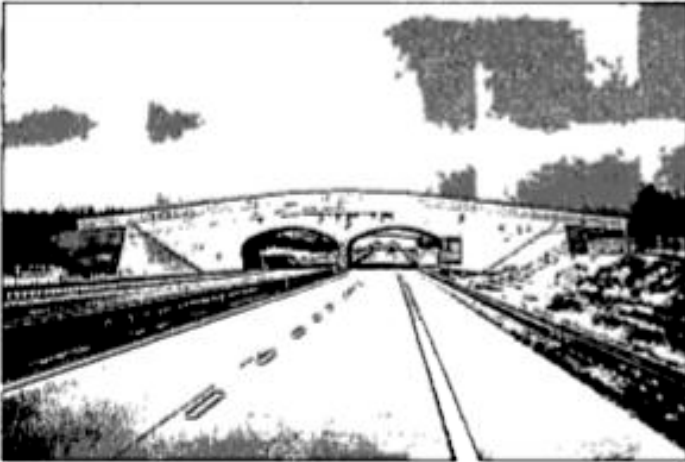A. (2, -4)

B. (4, -2)

C. (-2, -2)

D. (-4, -4)

Answer:

▶ Watch Video Solution

206. Case Study Based- 3
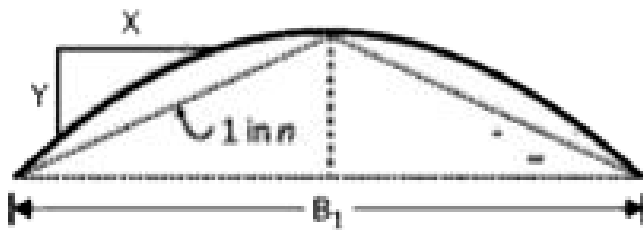
Applications of Parabolas-Highway

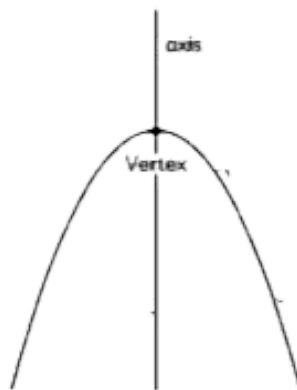Overpasses/Underpasses A highway underpass

is parabolic in shape.

Parabola

A parabola is the graph that results from

$$p(x) = ax^2 + bx + c$$

Parabolas are symmetric about a vertical line known as the Axis of Symmetry. The Axis of Symmetry runs through the maximum or minimum point of the parabola which is called the Vertex.

The highway overpass is represented

graphically. Zeroes of a polynomial can be expressed graphically. Number of zeroes of polynomial is equal to number of points where the graph of polynomial

A. Intersect x-axis

B. Intersects y - axis

C. Intersects y axis or x- axis

D. None of these

Answer:

▶ **Watch Video Solution**

207. Case Study Based- 3

Applications of Parabolas-Highway Overpasses/Underpasses A highway underpass is parabolic in shape.
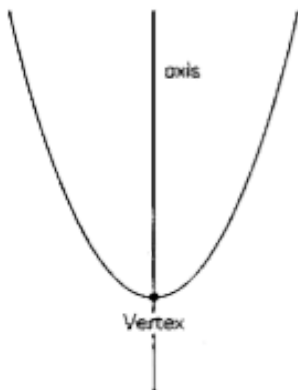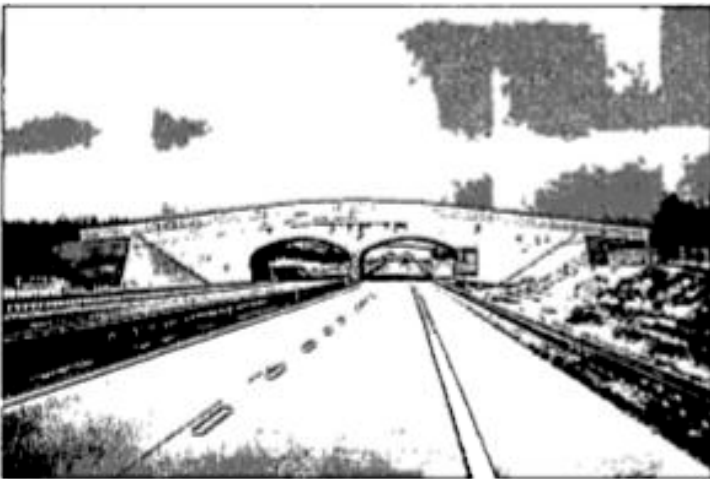

Parabola

A parabola is the graph that results from

$$p(x) = ax^2 + bx + c$$

Parabolas are symmetric about a vertical line known as the Axis of Symmetry. The Axis of Symmetry runs through the maximum or minimum point of the parabola which is called the Vertex.

The representation of Highway Underpass

whose one zero is 6 and sum of the zeroes is 0, is

A. `x^2- 6x + 2

B. $x^2 - 36$

C. $x^2 - 6$

D. $x^2 - 3$

Answer:

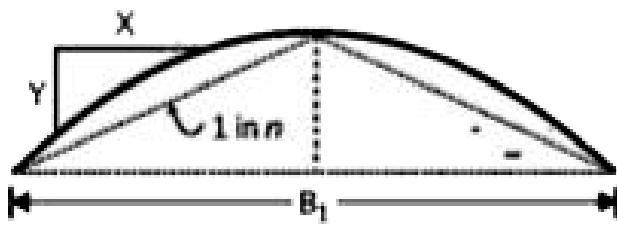**208.** Case Study Based- 3

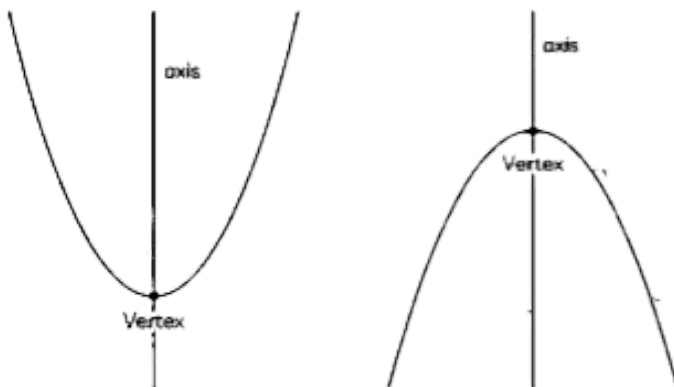Applications of Parabolas-Highway Overpasses/Underpasses A highway underpass is parabolic in shape.
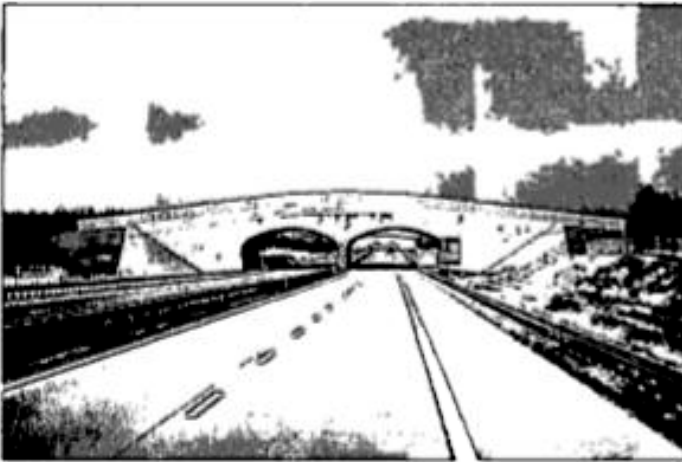
Parabola

A parabola is the graph that results from $p(x) = ax^2 + bx + c$
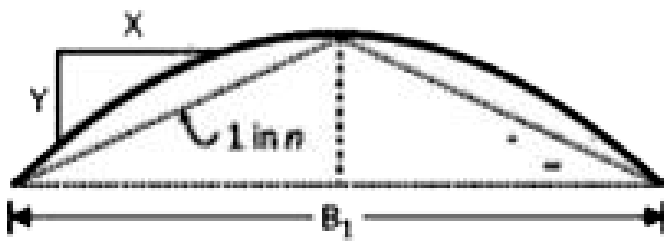
Parabolas are symmetric about a vertical line known as the Axis of Symmetry. The Axis of Symmetry runs through the maximum or minimum point of the parabola which is called the Vertex.
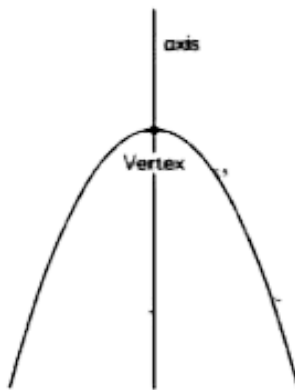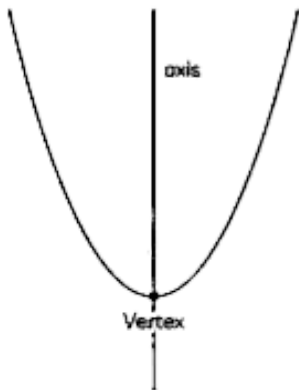
The number of zeroes that polynomial $f(x) = (x - 2)^2 + 4$ can have is:

A. 1

B. 2

C. 0

D. 3

Answer:

▶ **Watch Video Solution**

209. Case Study Based- 4

100m

RACE A stopwatch was used to find the time that it took a group of students to run 100 m.

Time (in sec)	0-20	20-40	40-60	60-80	80-100
No. of students	8	10	13	6	3

Estimate the mean time taken by a student to

finish the race.

(i)54

(ii)63

(iii)43

(iv)50

A. 54

B. 63

C. 43

D. 50

Answer:

210. Case Study Based- 4

100m RACE

A stopwatch was used to find the time that it took a group of students to run 100 m.

Time (in sec)	0-20	20-40	40-60	60-80	80-100
No. of students	8	10	13	6	3

What will be the upper limit of the modal class?

A. 20

B. 40

C. 60

D. 80

Answer:

211. Case Study Based- 4

100m RACE

A stopwatch was used to find the time that it

took a group of students to run 100 m.

Time (in sec)	0-20	20-40	40-60	60-80	80-100
No. of students	8	10	13	6	3

The construction of cumulative frequency table is useful in determining the
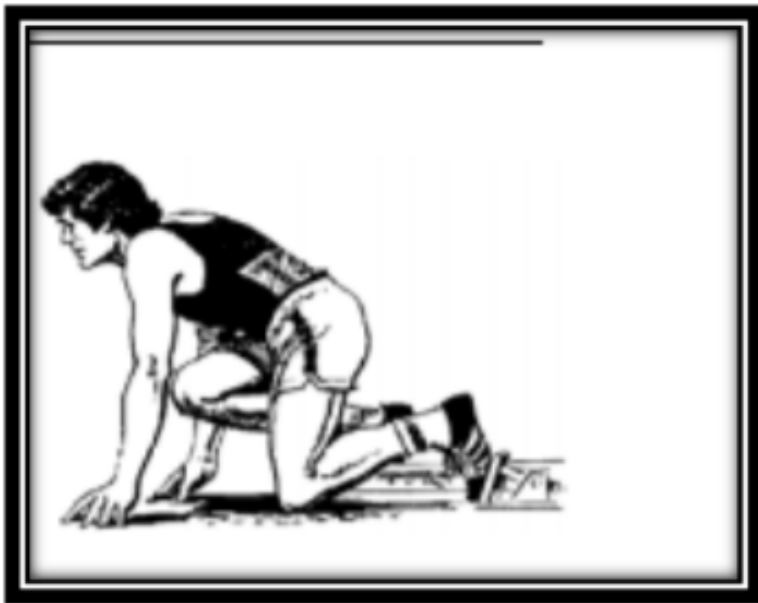
A. Mean

B. Median

C. Mode

D. All of these

Answer:

212. Case Study Based- 4

100m RACE

A stopwatch was used to find the time that it took a group of students to run 100 m.

Time (in sec)	0-20	20-40	40-60	60-80	80-100
No. of students	8	10	13	6	3

The sum of lower limits of median class and modal class is

A. 60

B. 100

C. 80

D. 140

Answer:

▶ **Watch Video Solution**

213. Case Study Based- 4

100m RACE

A stopwatch was used to find the time that it took a group of students to run 100 m.

Time (in sec)	0-20	20-40	40-60	60-80	80-100
No. of students	8	10	13	6	3

How many students finished the race within 1 minute?

A. 18

B. 37

C. 31

D. 8

Answer:

214. 3 bells ring at an interval of 4,7 and 14 minutes. All three bell rang at 6 am, when the three balls will the ring together next?

215. Find the point on x-axis which is equidistant from the points (2,-2) and (- 4,2).

216. Find the point on x-axis which is equidistant from the points (2,-2) and (-4,2)

OR

P (-2, 5) and Q (3, 2) are two points. Find the co-ordinates of the point R on PQ such that PR=2QR

217. Find a quadratic polynomial whose zeroes are $5-3\sqrt{2}$ and $5+3\sqrt{2}$.

218. Draw a line segment AB of length 9cm. With A and B as centres, draw circles of radius 5cm and 3cm respectively. Construct tangents to each circle from the centre of the other circle.

219. If $\sqrt{3}\sin\theta - \cos\theta = \sqrt{2}$, then one general value of θ is:

220. In the figure, quadrilateral ABCD is circumscribing a circle with centre O and $AD \perp AB$. If radius of incircle is 10cm, then the value of x is
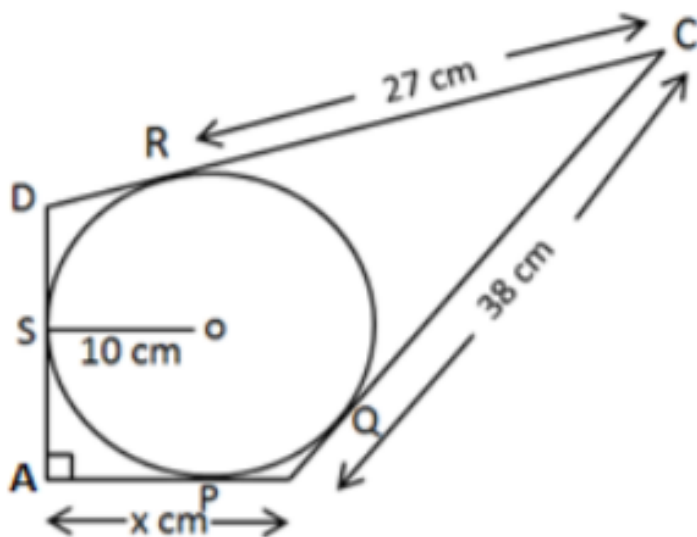
221. Prove that $2 - \sqrt{3}$ is irrational.

222. The roots α and β of the quadratic equation $x^2 - 5x + 3(k - 1) = 0$ are such that $\alpha - \beta = 1$. Find the value k

223. In the figure, ABCD is a square of side 14 cm. Semi-circles are drawn with each side of square as diameter. Find the area of the shaded region.
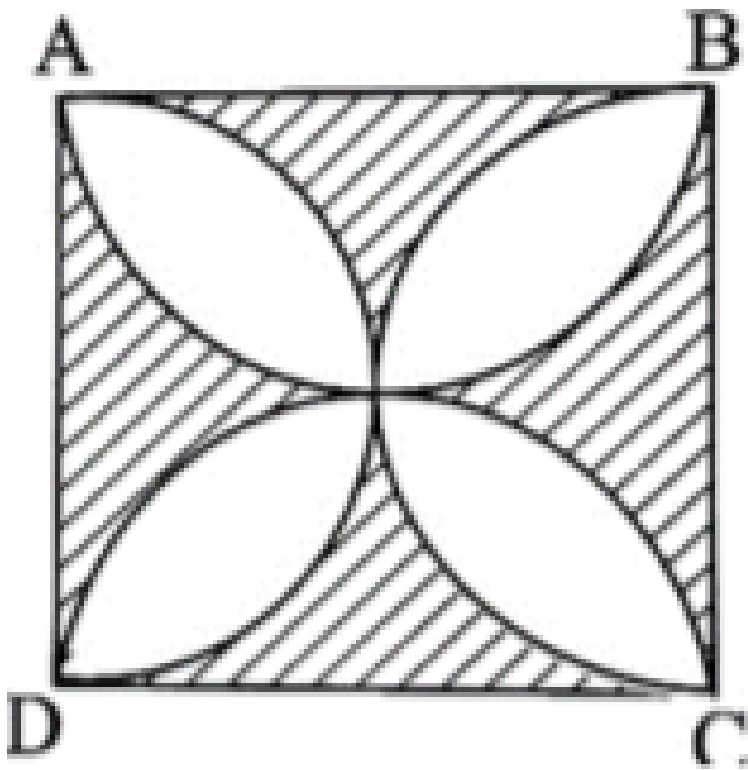
224. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9 cm, then the corresponding side of second triangle is ……….

225. In an equilateral triangle ABC, D is a point on side BC such that $BD = \dfrac{1}{3}BC$. Prove that $9AD^2 = 7AB^2$.

226. The median of the following data is 16. Find the missing frequencies a and b, if the total of the frequencies is 70.

Class	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	12	a	12	15	b	6	6	4
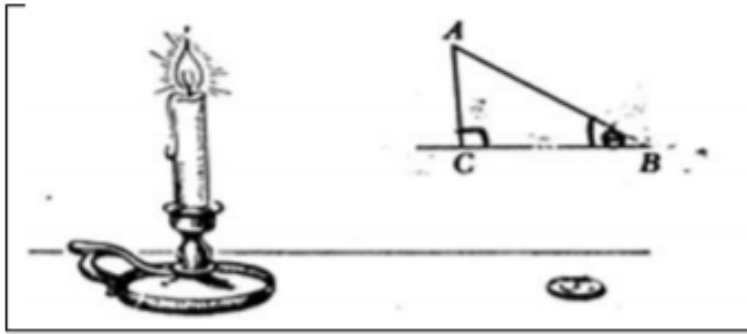
227.

If the angles of elevation of the top of the candle from two coins distant 'a' cm and 'b' cm $(a > b)$ from its base and in the same straight line from it are $30°$ and $60°$, then find the height of the candle.

▶ **Watch Video Solution**

228. The two palm trees are of equal heights and are standing opposite each other on either side of the river, which is 80 m wide. From a point O between them on the river the angles of elevation of the top of the trees are $60°$ and $30°$, respectively. Find the height of the trees and the distances of the point O from the trees.

OR

The angles of depression of the top and bottom of a building 50 meters high as observed from the top of a tower are $30°$ and

$60°$ respectively. Find the height of the tower, and also the horizontal distance between the building and the tower.

229. The angles of depression of the top and bottom of a building 50 metres high as observedfrom the top of a tower are $30°$ and $60°$, respectively. Find the height of the tower and also the horizontal distance between the building and the tower.

230. Water flows through a circular pipe whose internal diameter is 2 cm, at the rate of 0.7 m per second into a cylindrical tank, the radius of whose base is 40 cm. By how much will the level of water rise in the tank in half an hout ?

231. Write any two irrational numbers whose product is rational number.

232. LCM of $\left(2^3 \times 3 \times 5\right)$ and $\left(2^4 \times 5 \times 7\right)$ is

233. A quadratic polynomial , whose zeroes are -3 and 4 is

234. Discuss the nature of the quadratic equation $2x^2 + x + 4 = 0$

235. Write the 2nd term of the AP, if its $S_n = n^2 + 2n.$

236. Find the roots of $x + \dfrac{1}{x} = 2$

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

238. If the distance between the points (4,p) and (1,0) is 5 , then find the value of p.

239. Find the distance between the points (0, 6) and (0, -2).

240. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O

at a point Q so that OQ = 12 cm. Length PQ is:
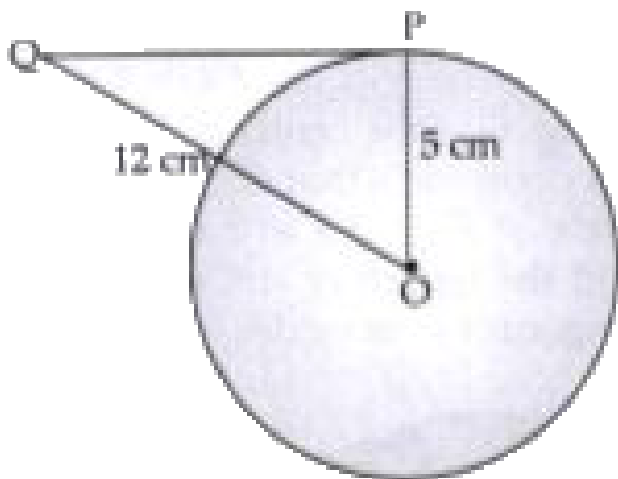
241. State and prove the Pythagoras theorem.

242. From a tank containing 10 male fish and 12 female fish, a fish is taken out, then probability that it is a female fish is?

▶ **Watch Video Solution**

243. Find the number if eight times of its is added to its square, the sum so obtained is -16.

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244. Find the value of $(1 + \cos A)(1 - \cos A)\cos ec^2 A.$

▶ Watch Video Solution

245. Find the maximum value of $\dfrac{1}{\cos ec\theta}$

▶ Watch Video Solution

246. If $\tan\theta + \cot\theta = 2$ then the value of $\tan^2\theta + \cot^2\theta$ is

247. Case Study-1:

Due to covid-19 lockdown, Ramesh decides to redo his house garden with some plantation work with his son. They have an equilateral triangle shaped garden and he has planted the garden with 6 different types of flowers (each of radius 1 m within a circular area). This left the remaining part of garden (that is outside the circular plants area) with lush green grass.
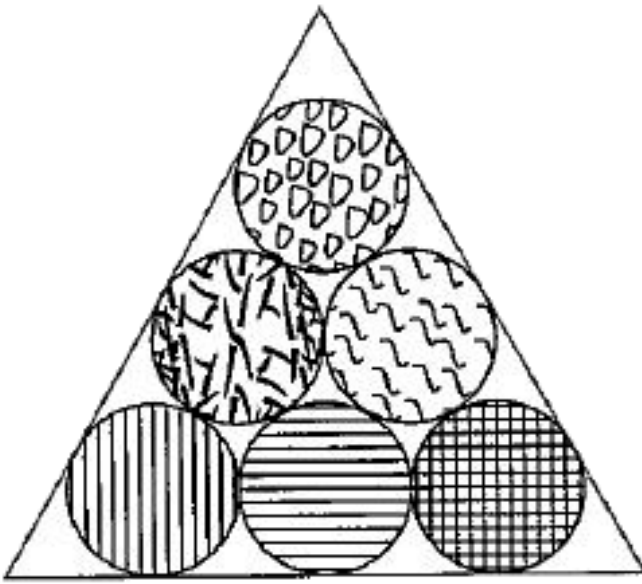
Now, comes the part of adding boundaries to corner the garden off nicely and he needs to know some calculations for it.

A boundary wall of height 25 cm is to be made around the garden leaving a space of 1 m wide for a gate on one side. The total length of boundary wall is

A. 18m

B. 20 m

C. 21 m

D. 22m

Answer:

▶ **Watch Video Solution**

248. The students of a shool decided to beautifly the school on the annual day by fixing colourful flags on the straight passage

of the school. They have 27 flags to be fixed at intervals of every 2 m. The flags are stored at the position of the middle most flag. Ruchi was given the responsibility of placing the flags.

Ruchi kept her books where the flags wer stored. She could carry only one flag at a time. How much distance she did cover in completing this job and returning back to collect her books ? What is the maximum distance she travelled carrying a flag ?

A. 22m

B. 24m

C. 26m

D. 28m

Answer:

249. Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is

'h', which is given by $h = -16t^2 + 64t + 80$

80 m

What is the height reached by the ball after 1 second ?

A. 135 m

B. 140m

C. 128m

D. 145m

Answer:

250. Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is 'h', which is given by $h = -16t^2 + 64t + 80$

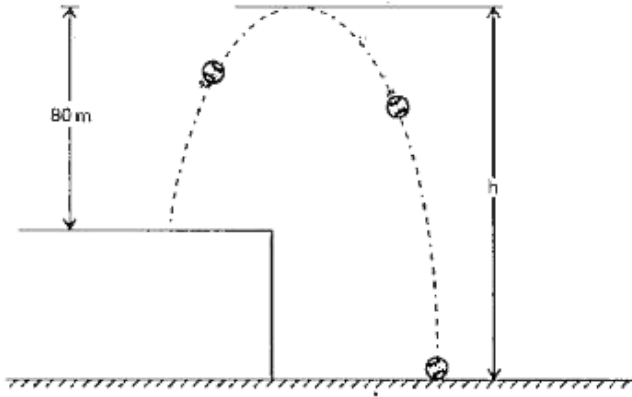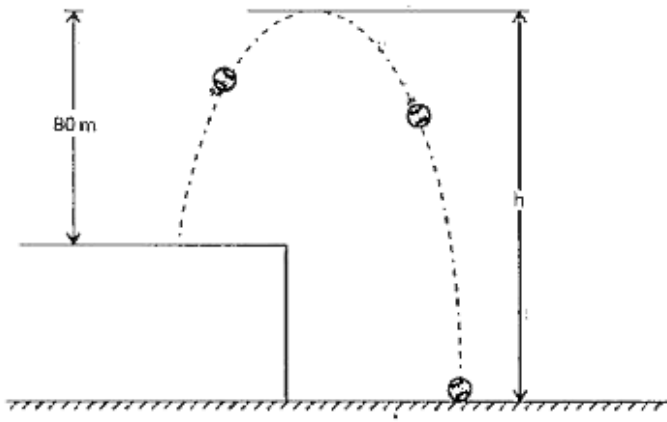What is the maximum height reached by the ball ?

A. 154m

B. 144m

C. 136m

D. 158m

Answer:

251. Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is 'h', which is given by $h = -16t^2 + 64t + 80$

How long will the ball take to hit the ground ?

A. 4 second

B. 3 second

C. 5 second

D. 6 second

Answer:

252. Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is 'h', which is given by $h = -16t^2 + 64t + 80$
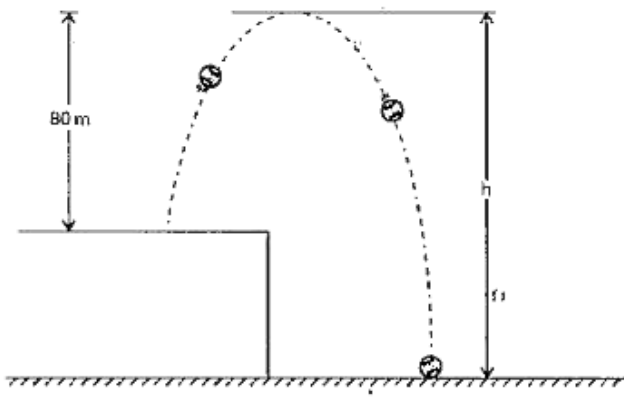
What are the two possible times to reach the ball at the same height of 128 m ?

A. 1 and 3 second

B. 1.5 and 2.5 second

C. 0.5 and 2.5 second

D. 1.6 and 2.6 second

Answer:

▶ Watch Video Solution

253. Soumya throws a ball upwards, from a rooftop, 80 m above. It will reach a maximum height and then fall back to the ground. The height of the ball from the ground at time 't' is 'h', which is given by $h = -16t^2 + 64t + 80$
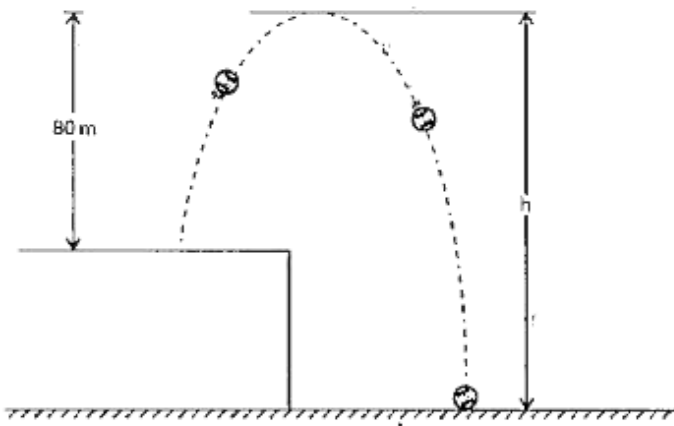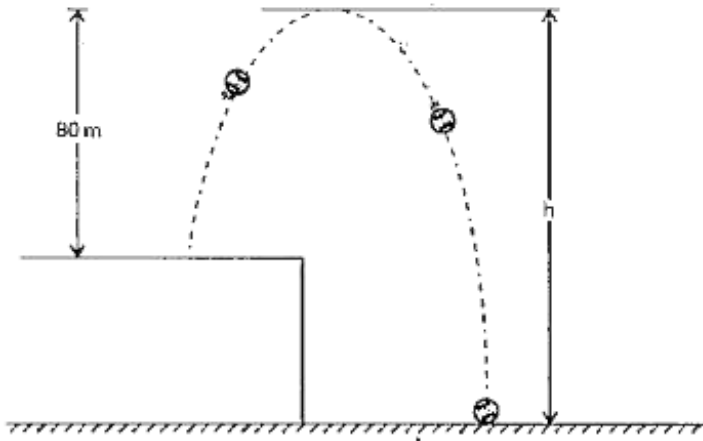

After 6 seconds, where is the ball ?

A. at the ground

B. rebounds

C. at highest point

D. fall back

Answer:

▶ **Watch Video Solution**

254. Assuming that $\sqrt{2}$ is irrational, show that $5 + \sqrt{2}$ is an irrational number.

▶ **Watch Video Solution**

255. Find the greatest number that divides 338 and 59 and leaves remainders of 2 and 5 respectively.

▶ **Watch Video Solution**

256. Three consecutive vertices of a parallelogram are (-2,-1), (1,0) and (4,3). Find the fourth vertex

▶ **Watch Video Solution**

257. The perpendicular bisector of the line segment joining the points A(1,5) and B(4,6) cuts the Y-axis at

▶ **Watch Video Solution**

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

▶ **Watch Video Solution**

259. Find the angle of elevation of the sun when the shadow of a pole 'h' metres high is $\sqrt{3}h$ metres long.

▶ **Watch Video Solution**

260. The ratio of the volume of a cube to that of a sphere which will fit inside the cube is

▶ **Watch Video Solution**

261. The volume of the largest right circular cone that can be cut out of a cube of edge 7 cm ?

(Use $\pi = \dfrac{22}{7}$)

262. Determine the zeroes of the polynomial $p(x) = x^3 - 2x^2$. Also verify the relationship between the zeroes and the coefficient.

263. ₹ 250 were divided equally among a certain number of children. If there were 25 more children, each would have received 50 paise less. Find the number of children.
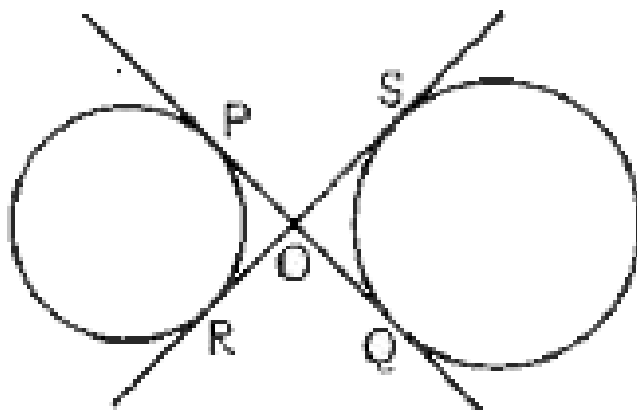
▶ **Watch Video Solution**

264. If the centre of a circle is (2a,a-7) ,then Find the value of a , if the ciecle passes through the point (11,-9) and has diameter $10\sqrt{2}$ units .

265. In the figure, PQ and RS are the common tangents to two circles intersecting at O.

Prove that PQ=RS

266. In $\triangle ABC$, $\angle A$ is acute. BD and CE are perpendicular on AC and AB respectively. Prove that $AB \times AE = AC \times AD$.

267. Draw a circle of radius 4 cm. Construct a pair of tangents to it, the angle between which is $60°$. Also justify the construction. Measure the distance between the centre of the circle and the point of intersection of tangents.

268. If $x = a\cos^3\theta$ and $y = b\sin^3\theta$, prove that $\left(\dfrac{x}{a}\right)^{2/3} + \left(\dfrac{y}{b}\right)^{2/3} = 1.$

269. I toss three coins together. The possible outocmes are no heads, 1 head 2 head and 3 heads. So, I say that prbability of no heads is $\dfrac{1}{4}$. What is wrong with this conclusion?

270. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

271. Prove that

$$\frac{1 + \sec A - \tan A}{1 + \sec A + \tan A} = 1 - \frac{\sin A}{\cos A}$$

272. If $x = 2^2 \times 3^3 \times 7^2, y = 2^3 \times 3^2 \times 5 \times 7$

, then find HCF (x,y)

▶ **Watch Video Solution**

273. What is the HCF of the smallest prime

number and the smallest composite number?

▶ **Watch Video Solution**

274. IF α, β are the zeroes of the polynomial $5x^2 - 7x + 2$ then the sum of their reciprocal is:

275. If the lines represened by $3x + 2py = 2$ and $2x + 5y + 1 = 0$ are parallel, then find the value of p.

276. Find the 10th term form the end of the A.P

. 4 , 9, 14,. . .. . ,254 .

277. Solve for x and y $y, x + y = 3$ and $7x + 6y = 2.$

278. Find a quadratic polynomial whose zeroes are -3 and 5.

279. For what values of 'a' does the quadratic equation $x^2 - ax + 1 = 0$ not have real roots?

280. If p and q are the roots of the quadratic equation $x^2 + px - q = 0$, then find the values of p and q.

▶ **Watch Video Solution**

281. Which term of the AP 21, 42, 63, 84,.. Is 210?

▶ **Watch Video Solution**

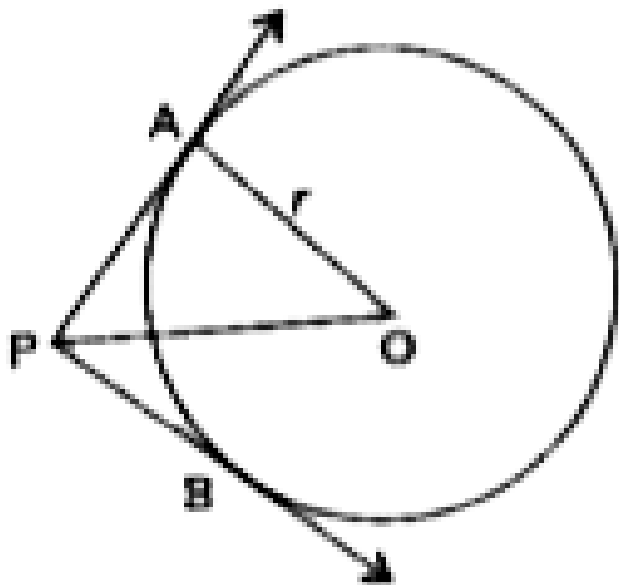**282.** Find distance between the points (0, 5) and (-5, 0)

▶ **Watch Video Solution**

283. What is the distance between two parallel tangents to a circle of radius 5 cm?

▶ **Watch Video Solution**

284. In the figure, $\angle APB = 90°$. Find the length of OP.

285. $\triangle ABC \sim \triangle DEF$ such that DE = 3 cm , EF = 2 cm , DF = 2.5 and BC = 4 cm . Find the perimeter of $\triangle ABC$.

286. If $\operatorname{cosec}\theta - \cot\theta = \dfrac{1}{3}$, then the value of $\operatorname{cosec}\theta + \cot\theta$ is:

287. If $\triangle ABC$ is right angled at C, then the value of cos(A+B) is

288. A wire is in the shape of a circle of radius 21 cm. It is bent to form a square. The side of the square is : $\left(\pi = \dfrac{22}{7} \right)$

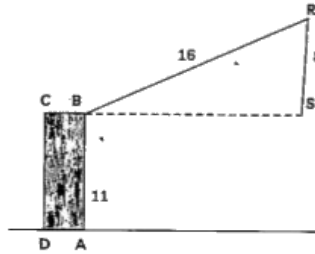**289.** If the area of three adjacent faces of a cuboid are X, Y and Z respectively, then find the volume of cuboid.

290. A crane stands on a level ground. It is represented by a tower ABCD, of height 11 m and a jib BR. The ib is of length 20 m and can rotate in a vertical plane about B.A vertical cable, RS, carries a load S. the diagram shows

current position of the jib, cable and load.

The length BS is

A. 8m

B. 12m

C. 13.9m

D. 17.9 m

Answer:

291. A crane stands on a level ground. It is represented by a tower ABCD of height 11 m and BR. The ib is of length 20 m and can rotate in a vertical plane about B.A vertical cable, RS, carries a load S. the diagram shows current position of the jib, cable and load.

The angle that the jib, BR, makes with the horizontal, is

A. $45°$

B. $30°$

C. $60°$

D. $75°$

Answer:

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292. A crane stands on a level ground. It is represented by a tower ABCD, of height 11 m and a jib BR. The Jib is of length 20 m and can rotate in a vertical plane about B.A vertical cable, RS, carries a load S. the diagram shows current position of the jib, cable and load.
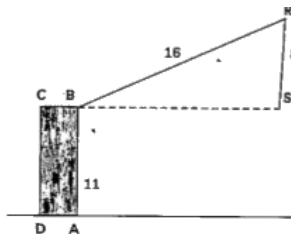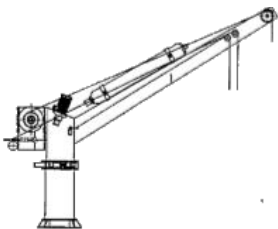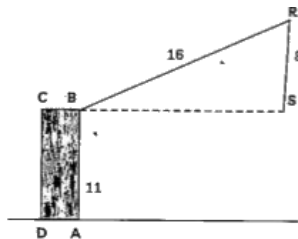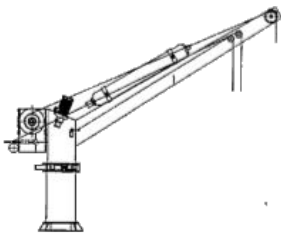

The measure of the angles BRS, is

A. $60°$

B. $75°$

C. $30°$

D. $45°$

Answer:

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293. NITI aayog has tasked their statistical officer to create a model for farmers to be able to predict their produce output based on various factors.

To test the model out, the officer picked a local farmer who sells apples to check various factors like weight, bad apples, half-cooked, green vs red etc.

A box containing 250 apples was opened and each apple was weighed.

The distribution of the masses of the apples is given in the following table:

Mass (in grams)	80-100	100-120	120-140	140-160	160-180
Frequency	20	60	70	p	60

The value of p is

A. 50

B. 40

C. 35

D. 45

Answer:

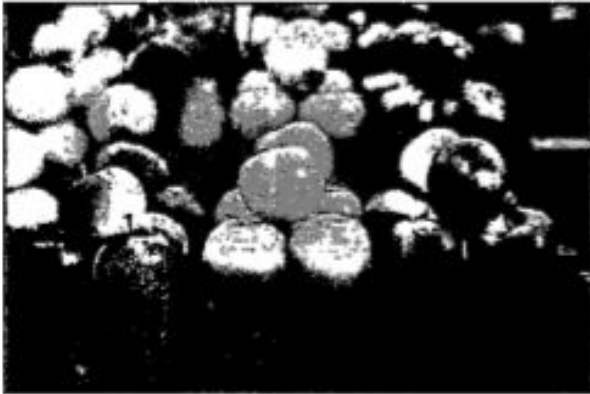**294.** NITI aayog has tasked their statistical officer to create a model for farmers to be able to predict their produce output based on various factors.

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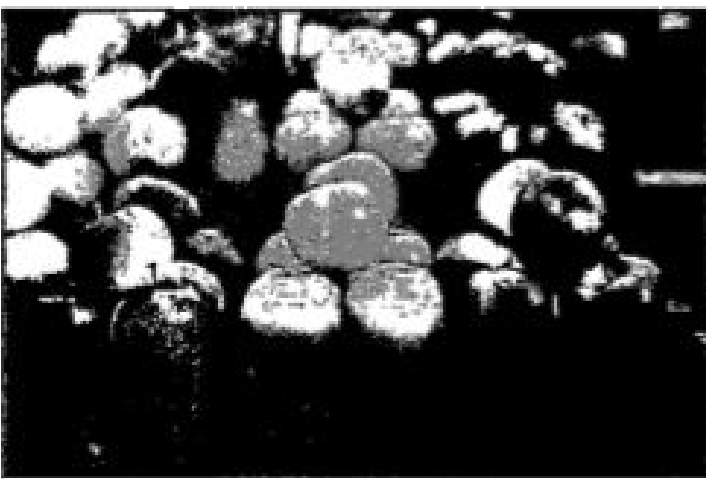
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given in the following table:

Mass (in grams)	80-100	100-120	120-140	140-160	160-180
Frequency	20	60	70	p	60

The lower limit of the modal class is

A. 80

B. 100

C. 120

D. 140

Answer:

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

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296. Without actually performing the long divison, find if $\dfrac{987}{10500}$ will have terminating or non-terminating (repeating) decimal expansion. Give reasons for your answer

297. Prove that the points $(a, b + c), (b, c + a)$ and $(c, a + b)$ are collinear.

298. Two opposite vertices of a square are $(-1, 2)$ and $(3, 2)$. Find the coordinates of other two vertices.

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299. In the figure, OABC is a rhombus, where O is the origin.
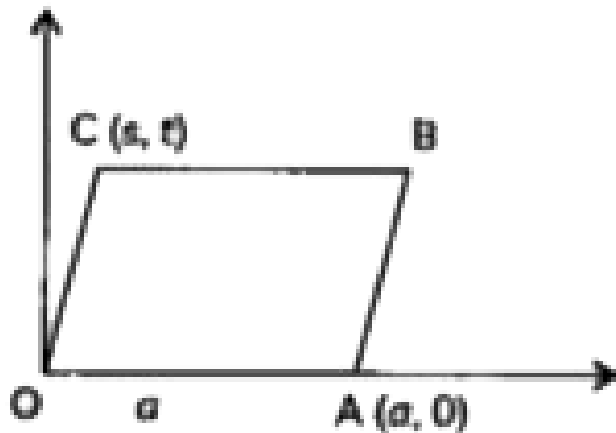
Write down the coordinates of B in terms of a, s and t.

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300. ABC is an isosceles triangle in which AB = AC. Prove that the tangent to the circum-circle at A is parallel to BC.

301. In an acute angled $\triangle ABC$, $\sec(B + C - A) = 2$ and $\tan(C + A - B) = \dfrac{1}{\sqrt{3}}$. Find the three angles of $\triangle ABC$.

302. Find the area of the shaded region in the given figure, if ABCD is a square of side 14 cm

and APD and BPC are semicircles.
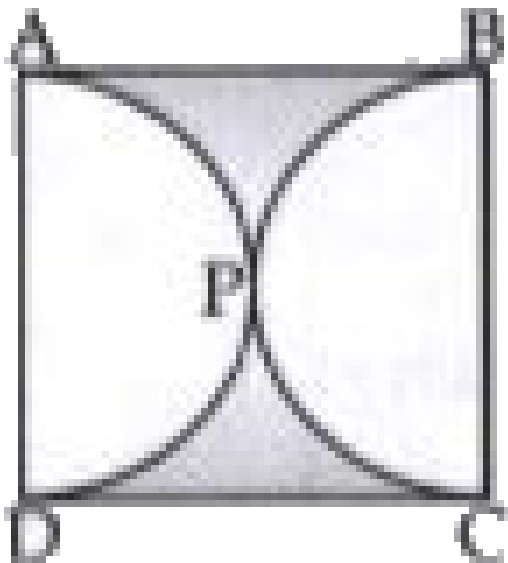
303. Show that 12^n cannot end with the digits 0 or 5 for any natural number n

304. Which term of the AP $-2, \; -7, \; -12, \ldots$ will be -77 ? Find the sum of this AP upto the term -77.

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305. 5 books and 7 pens together cost Rs 434, whereas 7 books and 5 pens together cost Rs 550, find the total cost of 1 book and 2 pens.

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306.

$$(\tan A)(1 + \sec A) - \frac{\tan A}{1 - \sec A} = 2 \cos ecA$$

307. If $\sin \theta = \frac{12}{13}$, find the value of $\frac{\sin^2 \theta - \cos^2 \theta}{2 \sin \theta \cos \theta} - \frac{1}{\tan^2 \theta}$.

308. If the zeros of the polynomial $f(x) = ax^3 + 3bx^2 + 3cx + d$ are in A.P. then show that $2b^3 - 3abc + a^2d = 0$

309. From the top of a tower h m high, angles of depression of two objects, which are in line with the foot of the tower are α and $\beta(\beta > \alpha)$. Find the distance between the two objects.

310. Two tangents TP and TQ are drawn to a circle with centre O from an external point T . Prove that $\angle PTQ = 2\angle OPQ$.

311. Prove that the area of the semicircle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the

semicircles drawn on the other two sides of the triangle

312. A dice is thrown twice. What is the probability that 2 will not come up either time?

313. A bag contains 5 red, 8 green and 7 white balls. One ball is drawn at random from the bag. Find the probability of getting neither a green ball nor a red ball.

314. Find th curved surface area of a right circular cone of height 15 cm and base diameter 16 cm.

315. The outer and inner diameters of a circular ring are 34 cm and 32 cm respectively. Find the area of the ring.

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316. If $2\sin 2\theta = \sqrt{3}, then f \in d the vakue of \theta.$

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317. If $\sin A = \dfrac{1}{2}$, $\cos B = 1, 0 < A, B \le \dfrac{\pi}{2}$,

then find the value of cot(A+B).

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318. Calculate the perimeter of a triangle XOY

with vertices X(3,4), O(0,0) and Y(6,0).

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319. If r =3 is a root of quadratic equation $kr^2 - kr - 3 = 0$ then find the value of k.

320. Find the degree of the polynomial `(x+1) (x^2-x+x^4 -1).

321. Can two numbers have 18 as their LCM?

Give reason to explain your answer.

322. Write the exponent of 3 in the prime

factorisation of 1944.

323. Find the value of k for which the equation kx(x-2) +6 =0 has equal roots.

324. Solve the quadratic equation for x: `(2x-3)^2=25.

325. Find the value of k for which the pair linear equations kx= 3y= k-2, 12x + ky= k has no solution.

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326. How many multiples of 4 lie between 10 nd 205?

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327. Find the zeros of the polynomial `x^2- 3x - m(m+3).

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328. For a rhombus ABCD, prove that $4AB^2 = AC^2 + BD^2$.

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329. An integar is choose at random between 1 to 100 . Find the probability that the chose number is divide by 10.

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330. Two different dice are rolled together. Find the probability of getting a sum of 10 of the numbers on the two dice.

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331. Find the area of the largest triangle that can be inscribed in a semi-circle of radius r units.

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332. Find the total surface area of a quadrant of a wooden sphere of radius 3.5 cm.

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333. If $\sin\theta - \cos\theta = 0$, then find the value of $\sin^4\theta + \cos^4\theta$.

334. Find the length of the altitute AL of an isosceles triangle ABC, where AB= AC= 5 cm and BC = 8 cm.

335. State ASA criterion of similarity of triangles.

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336. The mid-point of the line segment joining the points (- 2, 4) and (6, 10) is

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337. Find the value of 'a' if HCF (a, 18) =2 and LCM (a, 18) =36.

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338. Write one rational and one irrational number lying between 0.25 and 0.32.

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339. If n is a positive odd integar, then show that $n^2 - 1$ is divisible by 8 .

340. Check whether 15^n can end with digit zero for any natural number n.

341. Show that the roots of the quadratic equation:

$$(b - c)x^2 + (c - a)x + (a - b) = 0 \qquad \text{are}$$

equal if c+a=2b.

342. If P(5,7), Q(x,-2) and R(-3,y) are collinear points such that PR=2PQ, calculte the values of x and y.

343. Prove that the diagonals of a rectangle with vertices (0,0), (a,0),(a,b) and (0,b) bisect each other are equal.

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344. Draw a line segment AB of length 7 cm . Locate a point R on AB such that 7AR= 5RB

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345. The sum of circumferences of two circles os 132 cm. If tha radius of one circle is 14 cm, find the radius of the other circle.

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346. In a car park, there are 125 cars, 3p otorbikes, 2q lorrie and 20 buses. One of the vehicles leaves the car park at random. Given that the probability that the vehicle is a motorbike is $\dfrac{3}{40}$ and probability that the

vihicle is a bus is $\dfrac{1}{10}$, from a pair of linear

equations in p and q.

347. Find the HCF and the LCM of 72 and 120 ,

using prime factorisation method.

348. Express the length of a side of the nth

frame in terms of x and n.

349. Find the value of x.

350. A piece of wire is 99 cm long. It is cut bent into a frame in the sequence. Find the length of a side of the largest frame than can be formed.

351. If the roots of the equation $x^2 + 2cx + ab + 0$ are real and unequal, prove that the equation $x^2 - 2(a+b)x + a^2 + b^2 + 2c^2 = 0$ has no real roots.

352. Let A(4,2), B(6,5) and C(1,4) be the verticles of $\triangle\ ABC$. The median AD from A meets BC

in D. Find the coordinates of the point P and

AD such that, AP:PD = 2:1.

353. if $\tan\theta = \dfrac{12}{13}$, evaluate $\dfrac{2\sin\theta\cos\theta}{\cos^2\theta - \sin^2\theta}$

354. If

$\sec\theta + \tan\theta = m, provet\dfrac{\overparen{m^2 + 1}}{m^2 - 1} = \sin\theta.$

355. A sphere of diameter 6 cm is dropped in a right circular cylinderical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is just completely submerged in water, then the rise of water level in he cylindrical vessel is

356. From the first floor of Qutab Minor, which is at a height of 25 m from the level ground, a man observes the top of a building at an angle of elevation of $30°$ and the angle of depression of the base of the building to be $60°$. Calculate the height of the building.

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357. Prove that the line segments joining the mid-pointd of the sides of a triangle form four

triangled, each of which is similar to the original triangle.

358. A piece of cloth costs Rs. 35. If the piece were 4m longer and each metre costs Rs. 1 less, the cost would remain unchanged. How long is the piece?