MATHS

BOOKS - AGRAWAL PUBLICATION

Sample paper 10

Exercise

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

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2. Write a quadratic equation, sum of whose roots is $-3\sqrt{2}$ and their product is 4.
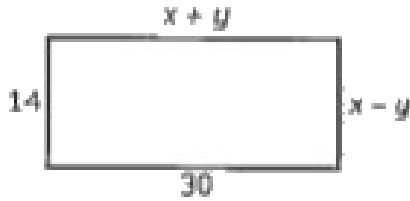
3. In an A.P. if $S_n = 5n^2 - 3n$ find the A.P.

OR

From the adjoining figure of a rectangle, find

the values of x ond y.

4. Find a point which divides the join of A (-3, 4) and B (9,6) internally in the ratio 3: 2.

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

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

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

8. For what value of k, do the equations

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

represent coincident lines ?

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

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

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

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

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

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

15. In triangle ABC, right-angled at B. if $\tan A = \dfrac{1}{\sqrt{3}}$,find the value of:

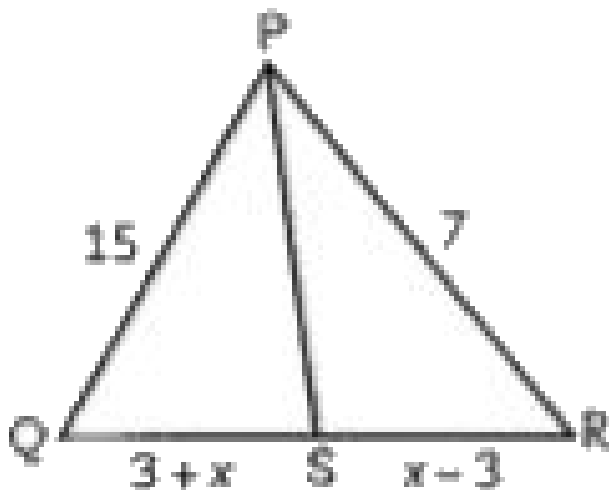$\sin A \cos C + \cos A \sin C$

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

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17. 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.

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18. 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?

19. If 6th term and 8th term of an A.P. are 12 and 22 respectively, then find its 2nd term.
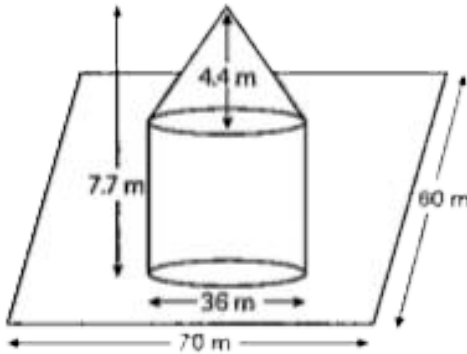
20. Determine zeros of polynomial p(x) $= x^3 - 7x$.

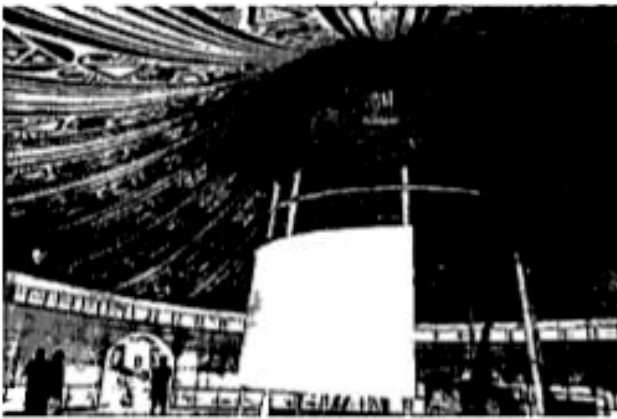**21.** Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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:
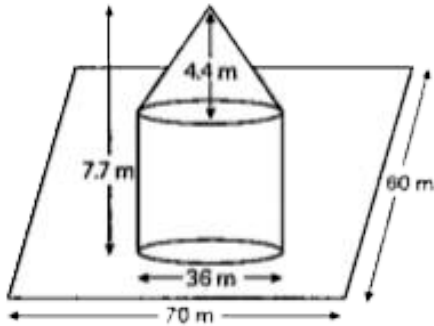
A. 2.3 m

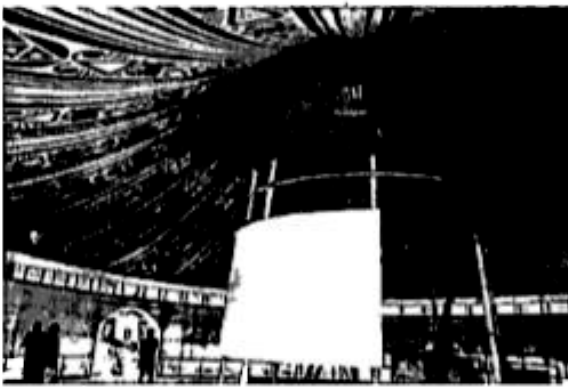B. 6.3 m

C. 3.3 m

D. 12.1 m

Answer:

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22. 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 slant height of the conical part is:

A. 18.3cm

B. 18.7 cm

C. 19.1 cm

D. 19.4cm

Answer:

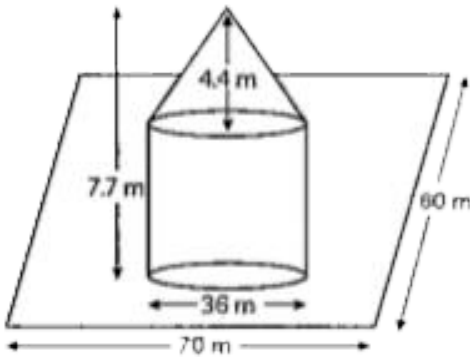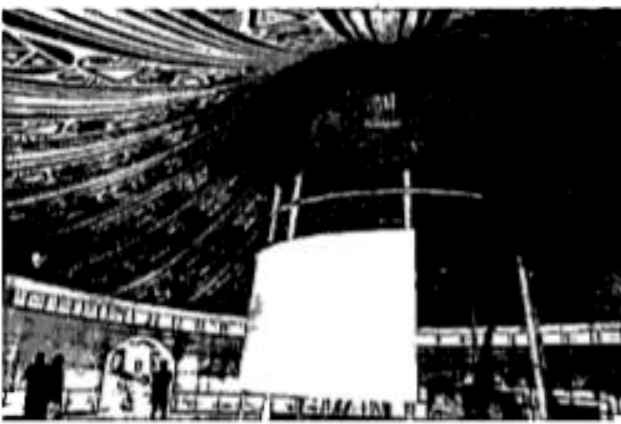**23.** Uttar Bantra Sarbojanin Durgotsav Committee had started planning for their Durga puja a year in advance with a mega budget in mind.

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To purchase the canvas, the area of the canvas

to be used approx in making the tent, is:

A. 1353 sq cm
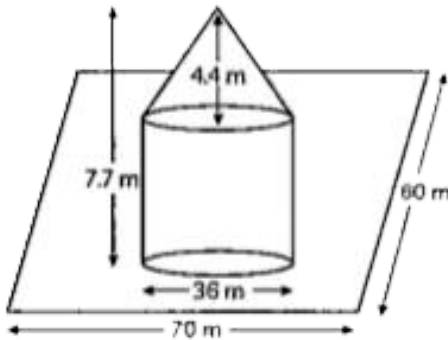
B. 1386 sq m

C. 1406 sq m

D. 1533 sq m

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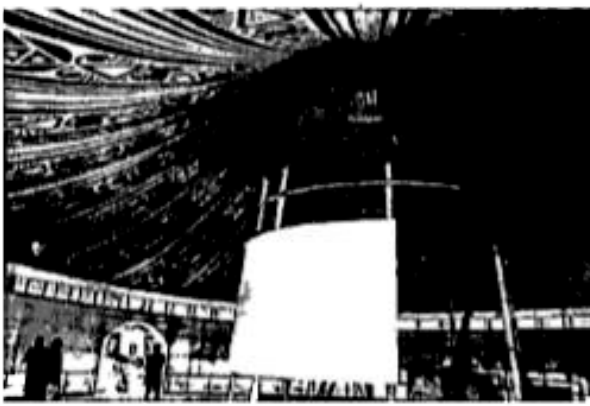
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The cost of canvas at ₹ 4.50, sq m is:

A. Rs 6327

B. Rs 6237

C. Rs 6898.50

D. Rs 6088.50

Answer:

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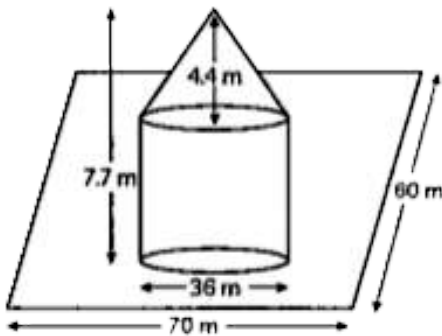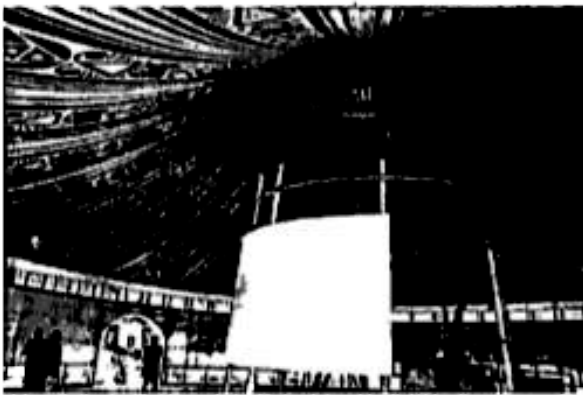
The area of the rectangular park outside the tent is:

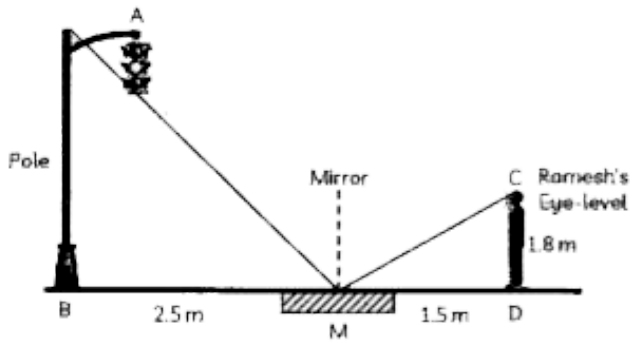A. 1883 sq m

B. 2864 sq m

C. 3182 sq m

D. 4200 sq m

Answer:

26. 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. $\triangle AMB$, $tra \in g \le CDM$

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

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

Answer:

27. 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.
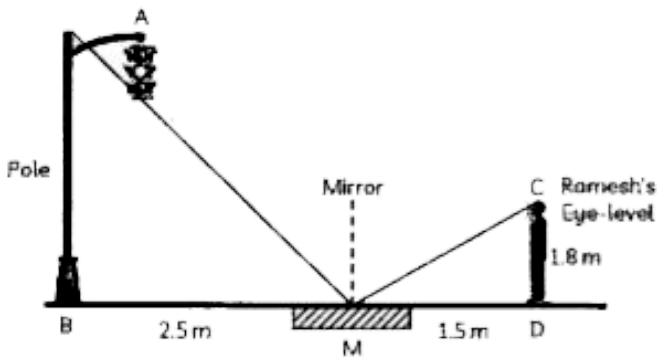
Which criterion of similarity is applicable to similar triangles?
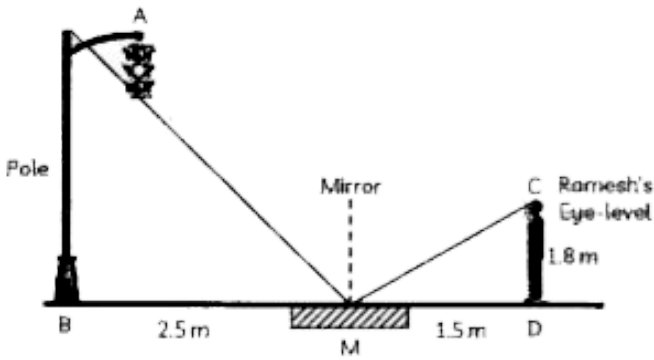
A. SSA

B. ASA

C. SSS

D. AAA

Answer:

28. 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.
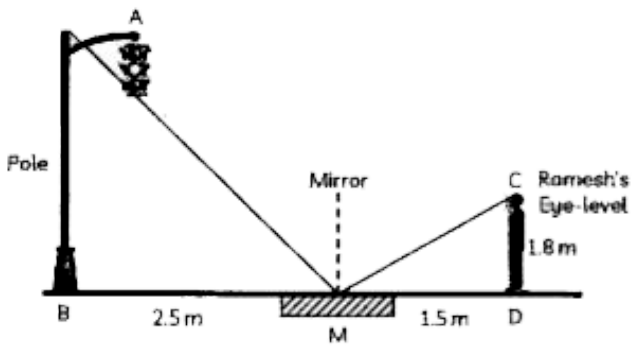
The height of the pole is:

A. 3 metres

B. 2.8 metres

C. 3.2 metres

D. 3.8 metres

Answer:

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29. 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 Ramesh's eye level is 1.2 m above the ground, then the height of the pole is:
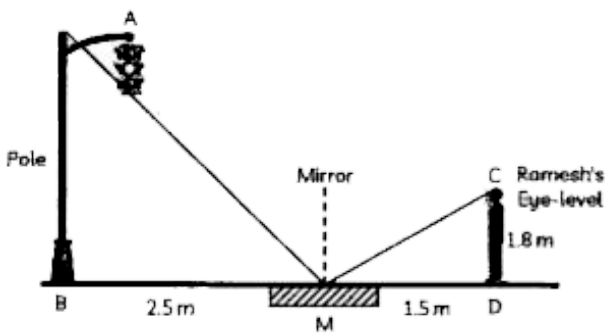
A. 3 metres

B. 2.6 metres

C. 2.2 metres

D. 2 metres

Answer:

30. 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:

31. 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 an odd number card in the first draw by the first boy is:

A. $\dfrac{11}{17}$
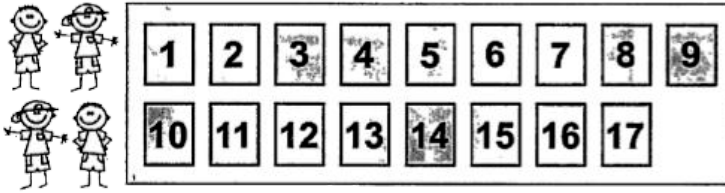
B. $\dfrac{10}{17}$

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

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

Answer:

32. 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.
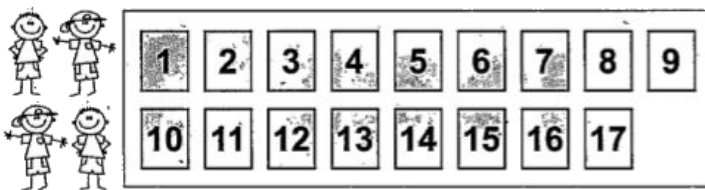
The probability of drawing a prime number card in the second draw by the second boy is

A. $\dfrac{3}{16}$
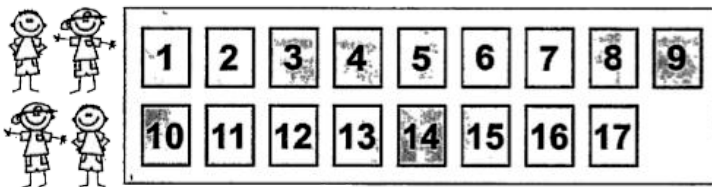
B. $\dfrac{7}{17}$

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

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

Answer:

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33. 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:

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

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

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

37. Prove that

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

38. 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).

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

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

41. Evaluate : $\dfrac{\sin 30^\circ + \tan 45^\circ - \cos ec60^\circ}{\sec 30^\circ + \cos 60^\circ + \cot 45^\circ}$
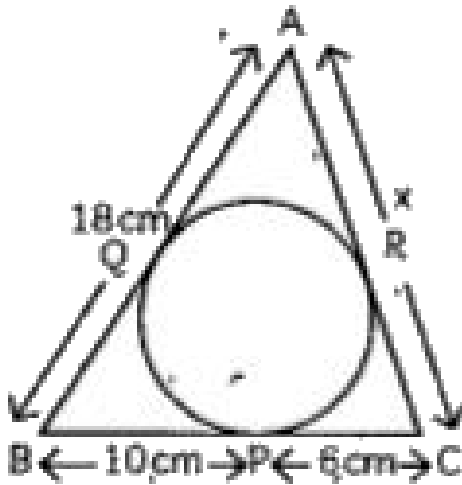
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42. If the points

$A(1, \, -2), B(2, 3), C(a, 2)$ and $D(-4, \, -3)$

forms a parallelogram, find the value of 'a'.

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

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

45. 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. $\left(use\pi = \dfrac{22}{7} \right).$

46. 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.

47. 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)

48. 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.

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

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

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51. A quadratic polynomial , whose zeroes are

-3 and 4 is

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52. Discuss the nature of the quadratic

equation $2x^2 + x + 4 = 0$

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

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

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

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56. If the distance between the points (4,p) and (1,0) is 5 , then find the value of p.
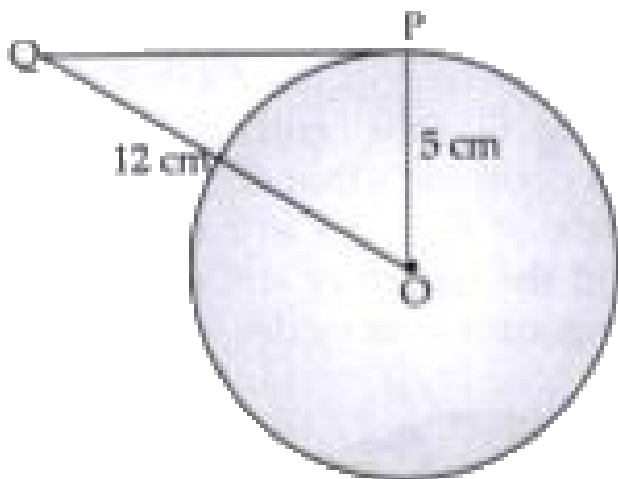
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57. Find the distance between the points (0, 6) and (0, -2).

58. 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:

12 cm

5 cm

59. State and prove the Pythagoras theorem.

60. 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?

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

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

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

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

65. 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.
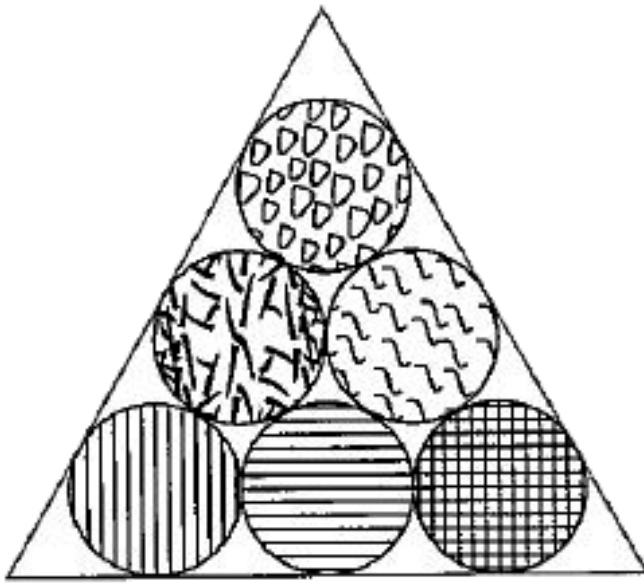
Now, comes the part of adding boundaries to corner the garden off nicely and he needs to know some calculations for it.

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:

66. 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 ?
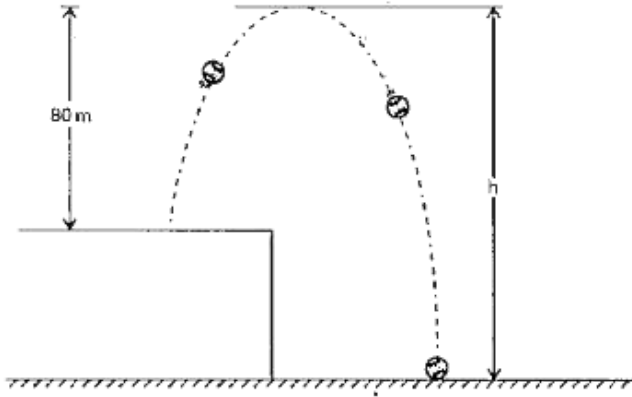
A. 22m

B. 24m

C. 26m

D. 28m

Answer:

67. 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 $h = -16t^2 + 64t + 80$

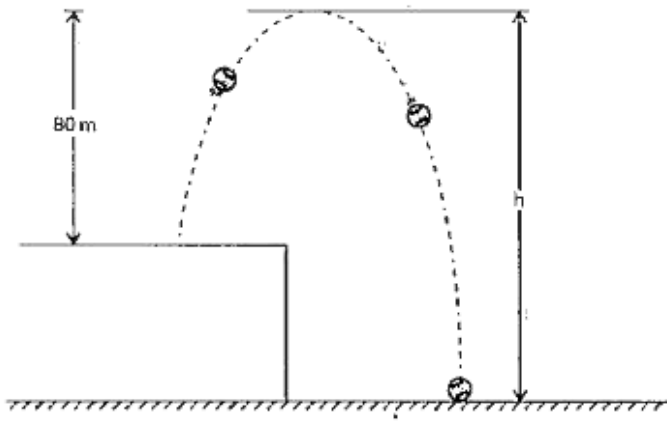What is the height reached by the ball after 1 second ?

A. 135 m

B. 140m

C. 128m

D. 145m

Answer:

68. 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 $h = -16t^2 + 64t + 80$

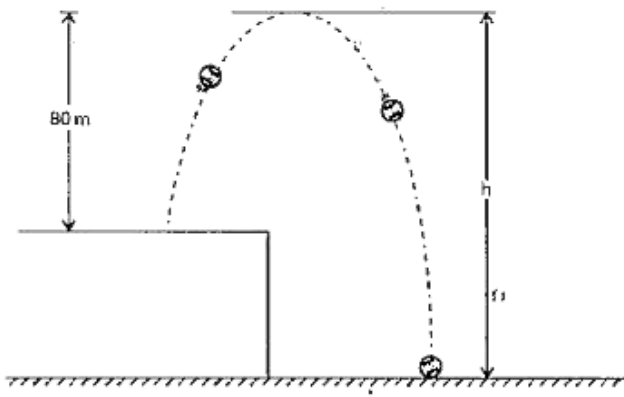What is the maximum height reached by the ball ?

A. 154m

B. 144m

C. 136m

D. 158m

Answer:

69. 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

h

f₁

How long will the ball take to hit the ground ?

A. 4 second

B. 3 second

C. 5 second

D. 6 second

Answer:

70. 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 $h = -16t^2 + 64t + 80$
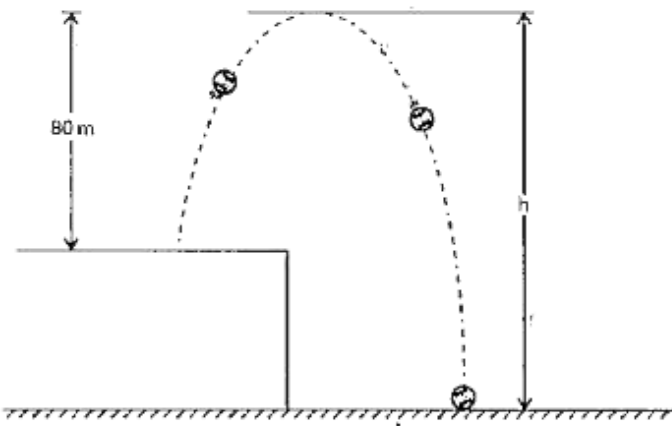
What are the two possible times to reach the ball at the same height of 128 m ?
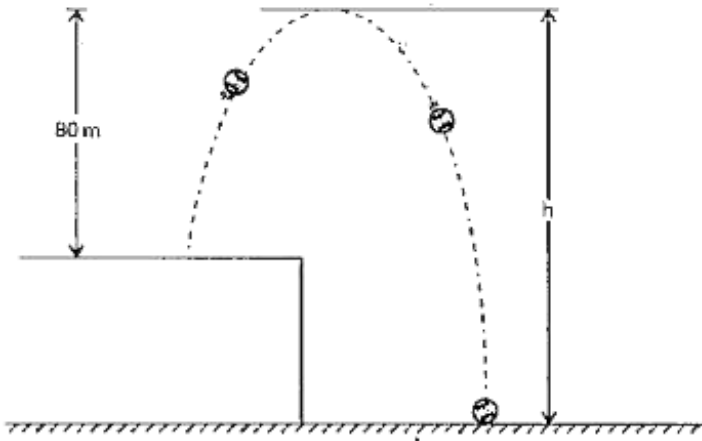
A. 1 and 3 second

B. 1.5 and 2.5 second

C. 0.5 and 2.5 second

D. 1.6 and 2.6 second

Answer:

71. 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:

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

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

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

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

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

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

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

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

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

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

81. ₹ 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.
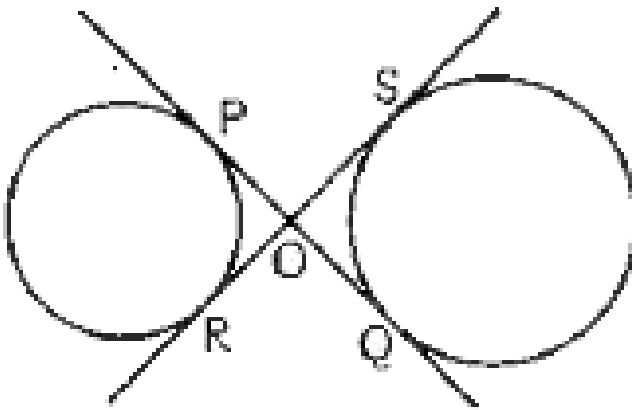
82. If the centre of a circle is (2a,a-7) ,then Find the value of a , if the ciecle passes through the point (11,-9) and has diameter $10\sqrt{2}$ units .

83. In the figure, PQ and RS are the common

tangents to two circles intersecting at O.

Prove that PQ=RS

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

85. 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.

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

87. 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 $\frac{1}{4}$. What is wrong with this conclusion?

88. 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.

89. Prove that

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

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