

1. What is $\frac{x^6 - 24x^4 + 144x^2}{(x^2 + 4\sqrt{3}x + 12)(x - 2\sqrt{3})^2}$ equal to?
 - (a) x^2
 - (b) $x^2 - 2$
 - (c) $x^2 + 2\sqrt{3}$
 - (d) $x^2 - 2\sqrt{3}$
2. If $\frac{a+b-c}{a-b-c} = k$ then the value of $\frac{a^2 + b^2 + 2ab - c^2}{a^2 + b^2 - 2ab - c^2}$ is
 - (a) $\frac{1}{k}$
 - (b) k^2
 - (c) k
 - (d) $\frac{1}{k^2}$
3. The three parts of a number are such that the half of part I, $\frac{1}{3}$ of part II and $\frac{1}{4}$ of part III are equal. The smallest part is 52, find the number.
 - (a) 234
 - (b) 243
 - (c) 230
 - (d) Cannot be determined
4. To do a certain work, A and B work on alternate days with B beginning the work on the first day. A alone can complete the same work in 24 days. If the work gets completed in $11\frac{1}{3}$ days, then B alone can complete $\frac{7^{th}}{9}$ part of the original work in?
 - (a) 4 days
 - (b) 6 days
 - (c) $5\frac{1}{2}$ days
 - (d) $4\frac{1}{2}$ days
5. A sum of Rs.6000 is deposited for 3 years at 5% per annum compound interest (compounded annually). The difference of interests for 3 and 2 years will be?
 - (a) Rs.75
 - (b) Rs.30.75
 - (c) Rs.330.75
 - (d) Rs.375
6. If $7\cos^2 A + 129\sin^2 A = 120$ and $170\cos^2 B + 158\sin^2 B = 161$ then the value of $\operatorname{cosec}^2 A \sec^2 B$ is?
 - (a) 16
 - (b) 9
 - (c) 1
 - (d) 8
7. 'A' while working 40% more efficiently can complete a piece of work in 25 days and 'B' while working 25% more efficiently can complete the same work in 21 days. While working with their original efficiencies 'A' and 'B' together worked for 9 days, then find the time taken by 'A' alone to complete the remaining work with his original efficiency.
 - (a) 7 days
 - (b) 14 days
 - (c) 12 days
 - (d) 6 days
8. A diamond weighing 35 grams cost Rs. 12,250 is cut down into two pieces having weights in the ratio of 5 : 2. If the price directly proportional to the square of the weight then find the loss incurred?
 - (a) Rs. 5000
 - (b) Rs.6000
 - (c) Rs.5500
 - (d) Rs.5700
9. A farming company produces two types of crops, A and B. The average cost of production of crop A is Rs 50,000, and crop B is Rs 70,000. They required 45 packet of seeds for crop A and 55 packet of seeds for crop B. Calculate the weighted mean for the production of crop?
 - (a) 60,000
 - (b) 61,000
 - (c) 65,000
 - (d) 67,000
10. In a data set, the interquartile range (IQR) is 15 and the median is 30. If the lowest data point is 10 What is the highest data point?
 - (a) 40
 - (b) 45
 - (c) 39
 - (d) 47
11. In a statistics class, 7 exam scores were recorded 85, 92, 76, 89, 95, 81, and 90. Calculate the mean, median, and mode of the exam scores.
 - (a) Mean $\approx$ 85, Median = 81, Mode = 65
 - (b) Mean: $\approx$ 86.85 Median: 89 Mode: 92
 - (c) Mean $\approx$ 80.08, Median = 91, Mode = 85
 - (d) Mean $\approx$ 80., Median = 81, Mode = Can't Determine
12. Students of a class are made to stand in rows. If three student is extra in a row, there would be two rows less. If one student is less in a row, there would be two rows more. Then, what is the number of students in the class?
 - (a) 10
 - (b) 11
 - (c) 12
 - (d) 13

13. The HCF of the two numbers is 29, and the other factors of their LCM are 15 and 13. The larger of the two numbers is:
 (a) 430 (b) 435
 (c) 406 (d) 464
14. A man goes from place A to B at a speed of 12 km/h and returns from B to A at a speed of 18 km/h. His average speed of the entire journey is?
 (a) $14\frac{2}{5}$ km/h (b) 15 km/h
 (c) 6 km/h (d) 30 km/h
15. What is the value of $\frac{a^2 + ac}{a^2c - c^3} - \frac{a^2 - c^2}{a^2c + 2ac^2 + c^3} - \frac{2c}{a^2 - c^2} + \frac{5}{a + c}$?
 (a) $-\frac{8}{(a + c)}$ (b) $\frac{8}{(a + c)}$
 (c) $\frac{9}{(a + c)}$ (d) $\frac{9}{(a - c)}$
16. If α and β are the roots of the equations $ax^2 - bx + c = 0$, then what is the value of $\left(\frac{1}{\alpha^2} - \frac{1}{\beta^2}\right)$?
 (a) $\frac{ab(\beta - \alpha)}{c^2}$ (b) $-\frac{a^2(\beta - \alpha)}{c^2}$
 (c) $\frac{-ab(\beta - \alpha)}{c^2}$ (d) None of these
17. If $x^2 + 4x - 4 = 0$, then find the value of $(x + 5)^4 + \frac{1}{(x + 5)^4}$?
 (a) 1150 (b) 1154
 (c) 1250 (d) 1320
18. Find number of digits in expansion of 72^{16} . ($\log_{10}2 = 0.30102$, $\log_{10}3 = 0.4771$)
 (a) 29 (b) 30
 (c) 28 (d) 31
19. The HCF of two numbers, each having three digits, is 17 and their LCM is 714. The sum of the numbers will be:
 (a) 289 (b) 391
 (c) 221 (d) 731
20. Solve for the number of integral values of x if $|x - 3| \geq 5$ & $|x + 3| < 7$.
 (a) 8 (b) 7
 (c) 5 (d) 4
21. A mother's age is 3 times that of her daughter's age. After 9 years, the mother's age will be twice the daughter's age. Determine their present ages.
 (a) 27,9 (b) 30,25
 (c) 2,9 (d) 1,40
22. The ratio between the ages of A and B is 2: 5. After 8 years, their ages will be in the ratio 1: 2. What is the difference between their present ages?
 (a) 20 years (b) 22 years
 (c) 24 years (d) 25 years
23. If $x^2 + x = 11$, then find the value of $(x + 3)^3 - \left(\frac{5}{x + 3}\right)^3$.
 (a) 50 (b) 100
 (c) 200 (d) 250
24. If $x^2 = 12 + \sqrt{12 + \sqrt{12 + \sqrt{12 + \sqrt{12 + \dots}}}}$, then what is one of the values of x equal to?
 (a) 2 (b) 3
 (c) 4 (d) 5
25. If $\sec A + \tan A = p$ then find the value of $\frac{p^2 + 1}{p^2 - 1}$ is
 (a) $\cos A$ (b) $\tan A$
 (c) $\sec A$ (d) $\operatorname{cosec} A$
26. If, $5(\cos\theta - 1) + \cos 2\theta + 3 = 0$, $0^\circ < \theta < 90^\circ$, then what is the value of $(2\sqrt{3} \times \cot \theta + 4\sqrt{3} \times \operatorname{cosec} \theta - \cos \theta)$?
 (a) 9.5 (b) 7.5
 (c) 13.5 (d) 12.5
27. If $\sec A = 4$ where, $A \in (0, \pi/2)$ then the value of $\frac{1 - \tan^2 A}{1 + \tan^2 A}$ is
 (a) $\frac{8}{7}$ (b) $\frac{7}{8}$
 (c) $-\frac{7}{8}$ (d) $-\frac{8}{7}$

28. $\tan 15^\circ \cdot \tan 25^\circ \cdot \tan 60^\circ \cdot \tan 65^\circ \cdot \tan 75^\circ = ?$

- (a) 1 (b) $\sqrt{3}$
(c) 0 (d) $\frac{1}{2}$

29. The angle of elevation of the top of a building of height 'a' metres from a point on the ground is found to be 45° . By moving 'b' metres towards the building, the angle of elevation increases by 15° . then, which one of the following best represents the ratio a: b?

- (a) $\frac{\sqrt{3}}{\sqrt{3}-1}$ (b) $\frac{\sqrt{3}}{\sqrt{2}-1}$
(c) $\frac{\sqrt{2}}{\sqrt{3}-1}$ (d) $\frac{\sqrt{3}}{\sqrt{3}+1}$

30. If θ is the angle of first quadrant such that $\sec^4 \theta = 15 + \tan^4 \theta$, then what is the value of $\sin \theta$?

- (a) $-\frac{7\sqrt{2}}{4}$ (b) $\frac{7\sqrt{2}}{4}$
(c) $\frac{8\sqrt{2}}{4}$ (d) None of these

31. From the top of a building 20 meters high, the angle of depression to a point on the ground is 45° . How far is the point from the building?

- (a) 10 meters (b) 20 meters
(c) 9 meters (d) 2 meters

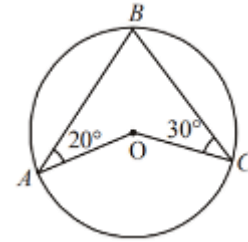
32. A T.V transmitter antenna of height 40 m stands at the top of a tall building. At a point on the ground, the angle of elevation of bottom of the antenna is 45° and that of top of antenna is 60° . What is the height of the building?

- (a) $20(\sqrt{2}+1)$ m (b) $20(\sqrt{3}-1)$ m
(c) $20(\sqrt{3}+1)$ m (d) $30(\sqrt{3}+1)$ m

33. If $\sin \theta + \operatorname{cosec} \theta = 2$, then what is the value of $\sin^6 \theta - \cos^6 \theta$?

- (a) 0 (b) 1
(c) -1 (d) 2

34. In the figure given below, O is the centre of the circle. What is $\angle AOC$?



- (a) 60° (b) 80°
(c) 100° (d) 120°

35. If $\sin \theta \cdot \cos \theta = \frac{\sqrt{5}}{4}$, then $\sin^4 \theta + \cos^4 \theta$ is equal to?

- (a) $\frac{1}{3}$ (b) $\frac{1}{8}$
(c) $\frac{3}{8}$ (d) $\frac{5}{8}$

36. If $\sin C - \sin D = x$, then the value of x is?

- (a) $2 \sin \left[\frac{(C+D)}{2} \right] \cos \left[\frac{(C-D)}{2} \right]$
(b) $2 \cos \left[\frac{(C+D)}{2} \right] \cos \left[\frac{(C-D)}{2} \right]$
(c) $2 \cos \left[\frac{(C+D)}{2} \right] \sin \left[\frac{(C-D)}{2} \right]$
(d) $2 \sin \left[\frac{(C+D)}{2} \right] \sin \left[\frac{(C-D)}{2} \right]$

37. $1 - x - x^n + x^{n+2}$, where n is a natural number, is divisible by

- (a) $(1-x)$ (b) $(1+x)^2$
(c) $(1-x)^2$ (d) None of these

38. Let a and b be real numbers satisfying the inequality $10x^2 + y^2 - 6xy + 15 \leq 8x - 1$. Find the value of $x^4 + y^2$.

- (a) 200 (b) 400
(c) 600 (d) 800

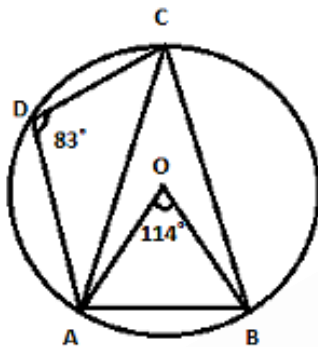
39. In a cylindrical wooden block has radius 9 cm and height 49 cm. A hemispherical portion of radius 14 cm is carved out from each of the circular ends of the block. What is the volume of the remaining block?

- (a) 900.34 cm^3 (b) 975.34 cm^3
(c) 1005.34 cm^3 (d) 1275.34 cm^3

40. Identical cubes of largest possible size are cut from a solid cuboid of size 65 cm x 26 cm x 3.9 cm. What is the total surface area (in cm^2) of all the small cubes taken together?

(a) 30420 (b) 15210
(c) 20280 (d) 16440

41. In the figure given below, if O is the center of the circle and $\angle DCB = 115^\circ$, then find the measure of angle DAC.



(a) 35° (b) 41°
(c) 39° (d) 47°

42. Two identical circles with centres T and U touch each other externally at point V such that $SV = VZ = 18$ cm. If XY and SX are two tangents to the circle with centre T and STUZ and XYZ are straight lines, then what is the value of $(YZ - SX)$?

(a) $18\sqrt{2}$ cm (b) $12\sqrt{2}$ cm
(c) $6\sqrt{2}$ cm (d) $9\sqrt{2}$ cm

43. If the roots of the equation $Ax^2 + Bx + C = 0$ are -1 and 1 , then which one of the following is correct?

(a) A and C are both zero
(b) A and B are both positive
(c) A and C are both negative
(d) A and C are of opposite sign

44. If $(a + b + c) = 11$ and $a^2 + b^2 + c^2 = 45$ then find the value of $(ab + bc + ca)$.

(a) 38 (b) 32
(c) 48 (d) 52

45. A number consists of two digits, whose sum is 9. If 27 is subtracted from the number, digits of the number are reversed. What is the product?

(a) 12 (b) 14
(c) 16 (d) 18

46. P, Q, R, and S were good childhood friends. P is fond of chocolates and always carries a few chocolates with him. One day when they met, P was carrying a box containing 'C' chocolates and gave Q $\frac{1}{2}$ of the total number of chocolates with him plus 1. To R, he gave $\frac{1}{3}$ of the remaining number of chocolates with him plus 2. Finally, to S, he gave $\frac{1}{4}$ of the remaining number of chocolates with him. Now, P is still left with 9 more chocolates. Find the best possible initial number of chocolates in the box.

(a) $C \leq 20$ (b) $21 \leq C \leq 30$
(c) $31 \leq C \leq 40$ (d) $C \geq 40$

47. What is the value of $P + q + r$, where P, q, r are integer.

(1) $P^2 + q^2 + r^2 - 27 = 0$
(2) $Pq + Pr + Pr - 11 = 0$

(a) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
(b) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
(c) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
(d) Statements (1) and (2) TOGETHER are not sufficient.

48. A cylindrical container, open at the top, has a height of 21 cm and a circumference at the base of 88 cm. It is filled with water to a height of 15 cm. A solid spherical ball of radius 7 cm is then submerged into the container, causing some water to overflow. Calculate the total volume of water after the ball is fully submerged?

(a) 3391.11π cubic cm (b) 3357.33π cubic cm
(c) 3387.11π cubic cm (d) 3397.33π cubic cm

49. A cylindrical container, open at the top, has a height of 21 cm and a circumference at the base of 88 cm. It is filled with water to a height of 15 cm. A solid

spherical ball of radius 7 cm is then submerged into the container, causing some water to overflow.

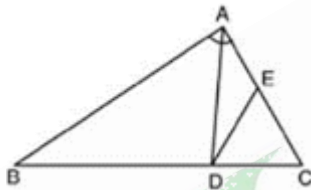
Calculate the height to which the water rises in the container after the ball is fully submerged?

- (a) 16.33 cm (b) 17.33 cm
(c) 18.33 cm (d) 19.33 cm

50. The ratio of the height of a right circular cone to the radius of its base is 4:3. If the curved surface area of the cone is 330 cm^2 , find the volume of the cone.

- (a) 658.17 cm^3 (b) 688.47 cm^3
(c) 698.47 cm^3 (d) 718.17 cm^3

51. In the given figure, $\angle BAC = 120^\circ$ and AD is the bisector of $\angle BAC$. If $\frac{AD \times AB}{BD} = \frac{AE}{EC}(AE + EC)$ and $\angle EDC$, what is the sum of $\angle B$ and $\angle C$?

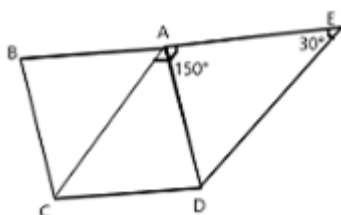


- (a) 20° (b) 30°
(c) 45° (d) 60°

52. A sum of money is invested in two different schemes. The first scheme offers 20% per annum compounded annually, and the second scheme offers 10% per annum compounded annually. After 2 years, the total interest earned from both schemes is Rs. 9,481. If the total amount invested is Rs. 40,000, find the amounts invested in each scheme.

- (a) Rs 3700, Rs 36300 (b) Rs 4000, Rs 36000
(c) Rs 4500, Rs 35500 (b) Rs 4700, Rs 35300

53. In the given fig below, AB and CD are parallel lines, $AD = AC$ and $\angle ACD = 2\angle E$, then which of the condition is correct?



- (a) Area of the parallelogram ABCD $>$ Area of $\triangle ADE$
(b) Area of the parallelogram ABCD = Area of $\triangle ADE$
(c) Area of the parallelogram ABCD $<$ Area of $\triangle ADE$
(d) Cannot be determined

54. The following question accompanied by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question:

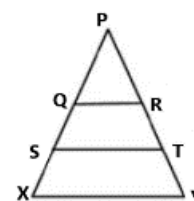
Question: A circular park has a certain radius. A rectangular playground is to be constructed inside the park such that the rectangle's sides are parallel to the park's diameter. Is the radius of the circular park sufficient to be determined?

Statement I: The perimeter of the rectangle is 150 meters.

Statement II: The area of the rectangle is 800 square meters.

- (a) Statement I alone is sufficient, but statement II alone is not sufficient
(b) Statement II alone is sufficient, but statement I alone is not sufficient
(c) Both statements together are sufficient, but neither statement alone is sufficient
(d) Both statements together are insufficient.

55. In the triangle PXY given, QR and ST are drawn parallel to XY, such that the areas of triangle PQR, quadrilateral QRTS and quadrilateral STYX are all equal. What is the ratio of the lengths of QR and ST?



- (a) $1:\sqrt{2}$ (b) $1:\sqrt{3}$
(c) $\sqrt{2}:1$ (d) $\sqrt{3}:1$

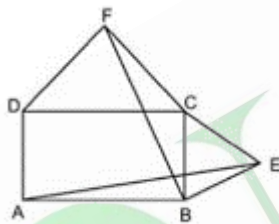
56. The hypotenuse of a right-angled triangle is 10 and one of its angles is 30° . Find the area (in sq.cm) of the largest circle that can be cut out from the triangle.

(a) $12.5\pi(1-\sqrt{3})$ (b) $12.5\pi(2-\sqrt{3})$
(c) $12\pi(2-\sqrt{3})$ (d) $12.5\pi(2-\sqrt{2})$

57. A circular park has a uniform width around it. The difference between the outer and inner circumferences of the path is 44 m. Find the area of the outer circle if the radius of inner circle is 3 m.

(a) 214.28 m^2 (b) 314.28 m^2
(c) 414.28 m^2 (d) 304.08 m^2

58. In the figure given below, ABCD is a rectangle and BCE and CDF are equilateral triangles. What is $\angle AEB + \angle BFC = ?$



(a) 10° (b) 20°
(c) 30° (d) 45°

59. A circle is inscribed in a right-angled triangle with the hypotenuse measuring 20 cm. The lengths of the other two sides of the triangle are a and b , and the radius of the inscribed circle is r . If the area of the triangle is 96 square cm, find the radius r of the inscribed circle.

(a) 2 cm (b) 4 cm
(c) 6 cm (d) 8 cm

60. Three friends, A, B, and C, invested in a business in the ratio 3:5:7, respectively. After 4 months, A withdrew half of his investment, B withdrew one-third of his investment, and C added 50% more to his investment. At the end of the year, the business made a profit of 2,74,000. How much profit was received by B?

(a) ₹70,000 (b) ₹75,000

(c) ₹78,000 (d) ₹80,000

61. The following question accompanied by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question:

Question: A circular sheet of metal has been cut into a sector with a central angle θ . The sector is then bent to form a conical shape. Is the central angle θ of the sector sufficient to be determined?

Statement I: The original radius of the circular sheet was 20 cm.

Statement II: The circumference of the base of the cone formed is 44 cm.

- (a) Statement I alone is sufficient, but statement II alone is not sufficient
(b) Statement II alone is sufficient, but statement I alone is not sufficient
(c) Both statements together are sufficient, but neither statement alone is sufficient
(d) Both statements together are insufficient.

62. If the two sides of a triangle are 40 and 17 respectively, and the area of the triangle is 160. Find the length of the third side (approx).

(a) 22.22 (b) 26.24
(c) 28.34 (d) 29.24

63. In a school, 120 students study Mathematics, 90 study Physics, and 70 study Chemistry. It is also known that 40 students study both Mathematics and Physics, 30 study both Physics and Chemistry, and 20 study both Chemistry and Mathematics. If 10 students study all three subjects, how many students are there in total in the school, assuming every student studies at least one of these subjects?

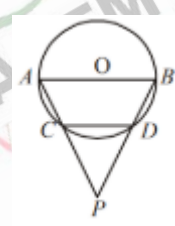
(a) 100 (b) 150
(c) 200 (d) 250

64. A solid metal sphere of radius 10 cm is melted down and recast into 8 smaller identical spheres.

Calculate the radius of each of these smaller spheres?

- (a) 4 cm (b) 5 cm
(c) 6 cm (d) 7 cm
65. A solid metal sphere of radius 10 cm is melted down and recast into 8 smaller identical spheres.
Find the total surface area of the 8 smaller spheres is what times of the surface area of the original sphere?
(a) 2 times (b) 3 times
(c) 4 times (d) None of these
66. A spherical tank of radius 6 meters is filled with water. A hemispherical bowl of radius 1.5 meters is used to empty the tank. How many full bowls of water are needed to empty the tank?
(a) 120 (b) 122
(c) 125 (d) 128
67. A shopkeeper mixes three varieties of sugar costing ₹50/kg, ₹60/kg, and ₹70/kg in the ratio 2:3: 5. He sells the mixture at a profit of $37\frac{1}{2}\%$. If the total mixture weighs 100 kg.
Find the cost price per kg of the mixture.
(a) ₹62/kg (b) 63/kg
(c) ₹64/kg (d) ₹65/kg
68. A shopkeeper mixes three varieties of sugar costing ₹50/kg, ₹60/kg, and ₹70/kg in the ratio 2:3: 5. He sells the mixture at a profit of $37\frac{1}{2}\%$. If the total mixture weighs 100 kg.
Find the selling price per kg of the mixture.
(a) ₹85.63 (b) ₹74.60
(c) ₹86.63 (d) ₹75.90
69. The following question accompanied by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question:
Question: What are the highest common factor (HCF) and least common multiple (LCM) of two numbers X and Y?
Statement I: The product of X and Y is 6075.
Statement II: The HCF of X and Y is 45.
(a) Statement I alone is sufficient, but statement II alone is not sufficient
(b) Statement II alone is sufficient, but statement I alone is not sufficient
(c) Both statements together are sufficient
(d) Both statements together are insufficient.
70. Solve the following expression:
$$\frac{1}{8} \left[\frac{1}{m-1} - \frac{1}{m+1} - \frac{2}{m^2+1} - \frac{4}{m^4+1} \right]$$

(a) $\frac{7}{m^8-1}$ (b) $\frac{1}{m^8-1}$
(c) $\frac{1}{m^8+1}$ (d) $\frac{4}{m^4-1}$
71. If $\sec^2 A + \tan^2 A = 5/3$ where $0^\circ < A < 90^\circ$, then find the value of $\sin^2 2A + \cos^2 A - \operatorname{cosec} A$.
(a) 1/2 (b) -1/2
(c) 1 (d) -1
72. Evaluate the following:
 $\cos(42^\circ + \theta) \times \cos(12^\circ + \theta) + \sin(42^\circ + \theta) \times \sin(12^\circ + \theta)$
(a) $\frac{\sqrt{3}}{2}$ (b) 1
(c) $\frac{1}{2}$ (d) 0
73. Two triangles ABC and PRQ are congruent to each other such that AB = 8 cm, QR = 15 cm and $\angle ABC = \angle PRQ = 90^\circ$. Find the circumradius of $\triangle ABC$.
(a) 17 cm (b) 3 cm
(c) 15.5 cm (d) 8.5 cm
74. If $\left(x + \frac{1}{x}\right) = \sqrt{3}$, then find the value of $\left(x^5 + \frac{1}{x^5}\right)$
(a) -3 (b) 3
(c) $\sqrt{-3}$ (d) $-\sqrt{3}$
75. Which of the following is not the possible number of odd factors for $N = p_1^4 \times p_2^3 \times p_3^2 \times p_4$?
(a) 24 (b) 120
(c) 60 (d) 36
76. If, $4x^2 + y^2 + 12x + 6y + 18 = 0$ then find the value of $\frac{2x+y}{4+6x}$
(a) -1.5 (b) -0.5
(c) 0.5 (d) 2.5
77. If $5^{3a+2b} = 625$ and $7^{2a+b} = 49$, then find the value of 'b'.

- (a) 1 (b) 2
(c) 3 (d) 4
- 78.** 'A' and 'B' start walking towards each other from point 'X' and 'Y', respectively. 'A' is walking at 4 m/s and 'B' is walking at 7 m/s. If distance between 'A' and 'B' is 60 metres and they're travelling back and forth between 'X' and 'Y', then find the total distance covered by 'B' by the time he meets 'A' for the third time given that distance covered by 'A' in that time is $\left(\frac{2P}{11}\right)$ metres.
- (a) $\left(\frac{750+P}{11}\right)$ metres (b) $\left(\frac{900+P}{11}\right)$ metres
(c) $\left(\frac{800+P}{11}\right)$ metres (d) $\left(\frac{1050+P}{11}\right)$ metres
- 79.** The cost price of articles 'A' and 'B' are in ratio 5:6, respectively. The amount of discount allowed on article 'A' and 'B' were in ratio 4:3, respectively, then the profit earned on selling both articles would be same. Find the selling price of article 'A'.
- Statement I: Marked price of both articles is Rs. 250, each.
- Statement II: If the amount of discount allowed on article 'A' to 'B' were in ratio of 3:4 while keeping the amount of total discount given being same, then the profit earned on selling article 'A' would've been of Rs. 50.
- Statement III: If the seller offers a discount of 40% on its marked price then there is no loss but as soon as the discount is more than 40%, there is loss.
- (a) The data given in statement I and II together is sufficient to answer the question while data in statement III alone is not sufficient to answer the question.
(b) The data given any of the two statements combined together is sufficient to answer the question.
(c) The data given either in statement I and II together or in statement I and III together is sufficient to answer the question
(d) The data given either in statement I and II together or data in statement II and III together are sufficient to answer the question.
- 80.** If $a + b + c = 21$ and $a^3 + b^3 + c^3 - 3abc = 63$, then find the value of $4(ab + bc + ca)$
- (a) 484 (b) 584
(c) 438 (d) 146
- 81.** A cylindrical tank of height 10 meters and radius 4 meters is filled with water. A metal sphere with a radius of 1 meter is dropped into the tank. Calculate the rise in the water level in the tank after the sphere is fully submerged.
- (a) 8.1 cm (b) 8.3 cm
(c) 9.3 cm (d) 9.8 cm
- 82.** In the figure given below $AO = CD$, where O is the centre of the circle. What is the value of $\angle DCP + \angle CDP = ?$
- 
- (a) 100° (b) 110°
(c) 120° (d) 130°
- 83.** If $x(x + y + z) = 36$ $y(x + y + z) = 64$ and $z(x + y + z) = 576$ then what is x equal to?
- (a) $\frac{19}{13}$ (b) $\frac{13}{18}$
(c) $\frac{18}{13}$ (d) $\frac{17}{18}$
- 84.** The diameter of circle with centre at C is 74 cm. CP is a radial segment of the circle. AB is a chord perpendicular to CP and passes through P. CP produced intersects the circle at D. If $DP = 25$ cm then what is the length of AB?
- (a) 70 cm (b) 72 cm
(c) 74 cm (d) 78 cm
- 85.** The mean of the values 1, 2, 3, 4, n with respective frequencies 1, 2, 3, 4, n is:
- (a) $\frac{n+1}{2}$ (b) $\frac{n+1}{3}$

(c) $\frac{2n-1}{3}$

(d) $\frac{2n+1}{3}$

86. The arithmetic mean of a set of 10 numbers is 50. If each number is first multiplied by 3 and then increased by 5, then what is the mean of new numbers?

- (a) 125 (b) 135
(c) 155 (d) 165

87. Consider the following statements in respect of the set, $P = \{1, 2, 3, \dots, n\}$.

1. $\frac{\left(\frac{n}{2}\right)^{\text{th}} \text{ term} + \left(\frac{n}{2} + 1\right)^{\text{th}} \text{ term}}{2}$ is the median of the

numbers in P

2. n is the mode of the numbers in P

Which of the above statements is/are correct?

- (a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

88. The following table shows the frequency distribution of a discrete variable Y with two missing frequencies:

Y	1	2	3	4	5
Frequency	3	p	9	q	4

Given that the total frequency is 40 and the arithmetic mean of Y is 3.2, find the values of the missing frequencies p and q.

- (a) p = 5 and q = 19 (b) p = 7 and q = 17
(c) p = 8 and q = 16 (d) p = 9 and q = 15

89. The following table gives the frequency distribution of life length in hours of 150 electric batteries. The median life is 30 hours. Find the missing frequencies f_2 and f_4 .

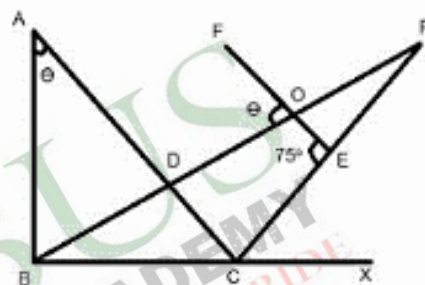
Life of battery(in hours)	Frequency
10-20	10
20-30	f_2
30-40	40
40-50	f_4
50-60	25
Total	150

- (a) $f_2 = 25$ and $f_4 = 25$ (b) $f_2 = 65$ and $f_4 = 20$
(c) $f_2 = 55$ and $f_4 = 10$ (d) $f_2 = 65$ and $f_4 = 10$

90. The average age of 8 family members living together is 30 years. Four of them are adults, and their average age is 45 years. The ages of the four children are in arithmetic progression having 2 as difference in ages. Find the mean and median of the ages of the children.

- (a) 11 years, 15 years (b) 12 years, 13 years
(c) 15 years, 15 years (d) 16 years, 16 years

91. In the following given figure $\triangle ABC$ is a right-angle triangle, right-angled at 'B'. Bisectors of $\angle ABC$ and $\angle ACX$ meet at point 'P'. Find the value of θ , if $\angle ABC = 90^\circ$

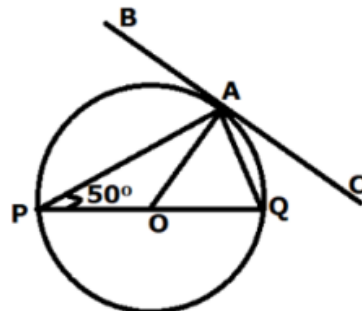


- (a) 50° (b) 15°
(c) 105° (d) 80°

92. In $\triangle ABC$, the bisectors of $\angle B$ and $\angle C$ intersect at the point M inside the triangle. If $\angle BMC = 108^\circ$, then find the value of $\angle A$.

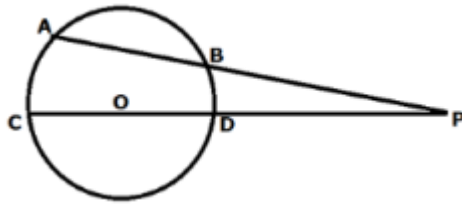
- (a) 144° (b) 54°
(c) 72° (d) 36°

93. In the figure given below, 'O' is the centre of the circle, BC is the tangent at point 'A' and PQ is the diameter. Find the measure of $\angle QAC$.



- (a) 50° (b) 40°
(c) 60° (d) 30°

94. In the figure given below, $PB = 5$ cm, $PA = 16$ cm and $OP = 12$ cm where 'O' is the centre of circle having radius 'R' cm. Find the diameter CD.



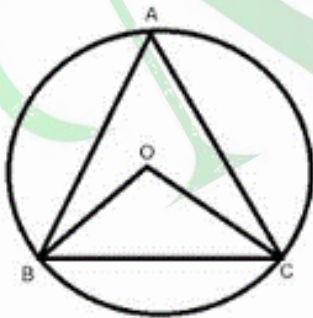
- (a) 22 cm (b) 16 cm
(c) 14 cm (d) 12 cm
95. Chords AB and CD of a circle with centre 'O' are mutually perpendicular at point 'P'. If $AP = 9$ cm, $PB = 4$ cm and $CP = 12$ cm, then find the radius of the given circle.

A. $5\sqrt{\frac{1}{10}}$ cm B. $5\sqrt{2}$ cm

C. $25\sqrt{\frac{1}{10}}$ cm D. $5\sqrt{\frac{1}{2}}$ cm

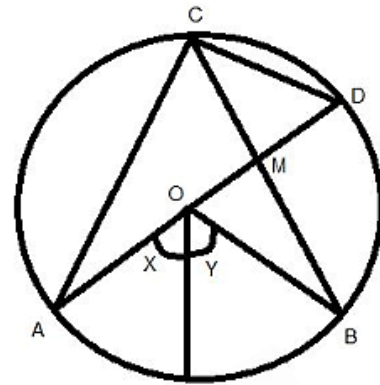
- (a) A (b) B
(c) C (d) D

96. In the given figure, O is the centre of the circle. If angle $\angle BAC = 72^\circ$, then find the measure of the $\angle OCB$.



- (a) 50° (b) 18°
(c) 36° (d) 40°

97. In the given figure, O is the centre of circle. $\angle CMD = 90^\circ$ and $\angle MDC = 2\angle MCD$. Find the value of $(X + Y)$.



- (a) 45° (b) 90°
(c) 60° (d) 120°

98. In the given figure, AB is the diameter of the circle and TA is a tangent on the circle at point 'A'. Find the radius of the circle.



- (a) $4.5\sqrt{5}$ cm (b) $9\sqrt{3}$ cm
(c) $7\sqrt{2}$ cm (d) $3\sqrt{5}$ cm

99. In a circle with center O, two chords KL and MN intersect at P. If $\angle KON = 120^\circ$ and $\angle LOM = 80^\circ$ then, find $\angle KPM$.

- (a) 70° (b) 80°
(c) 100° (d) 75°

100. 'P' is a point outside the circle, such that PA and PB are tangents to a circle at A and B, respectively. $\angle APB = 96^\circ$, then find $\angle BAP$.

- (a) 90° (b) 48°
(c) 42° (d) 84°

ANSWER KEY

1.	a	2.	c	3.	b	4.	b	5.	c	6.	a	7.	b	8.	a	9.	b	10.	b
11.	b	12.	c	13.	b	14.	a	15.	b	16.	a	17.	b	18.	b	19.	c	20.	a
21.	a	22.	c	23.	c	24.	c	25.	d	26.	a	27.	c	28.	b	29.	a	30.	d
31.	b	32.	c	33.	b	34.	c	35.	c	36.	c	37.	c	38.	b	39.	b	40.	a
41.	c	42.	d	43.	d	44.	a	45.	d	46.	d	47.	d	48.	d	49.	b	50.	c
51.	d	52.	d	53.	b	54.	c	55.	a	56.	b	57.	b	58.	c	59.	b	60.	a
61.	c	62.	b	63.	c	64.	b	65.	a	66.	d	67.	b	68.	c	69.	c	70.	b
71.	b	72.	a	73.	d	74.	d	75.	d	76.	c	77.	b	78.	b	79.	c	80.	b
81.	b	82.	c	83.	c	84.	a	85.	d	86.	c	87.	d	88.	d	89.	d	90.	c
91.	a	92.	d	93.	a	94.	b	95.	c	96.	b	97.	d	98.	a	99.	b	100.	c

