

1. If $\frac{a}{b+c} + \frac{b}{c+a} + \frac{c}{a+b} = 2$, then find the value of

$$\frac{a^2}{b+c} + \frac{b^2}{c+a} + \frac{c^2}{a+b} = ??$$

- (a) 0 (b) 1
(c) $(a+b+c)$ (d) $-(a+b+c)$

2. If $a = 5 + 2\sqrt{6}$, find the value of $\frac{3a^6 + 2a^4 + 5a^3 + 2a^2 + 3}{a^4 + 2a^3 + a^2}$?

- (a) $\frac{2735}{12}$ (b) $\frac{2937}{12}$
(c) $\frac{2935}{10}$ (d) $\frac{2935}{12}$

3. If $a + b + c = \frac{7}{17}$, $3a - 4b + 5c = \frac{3}{4}$ and $7a - 11b - 13c = -\frac{7}{17}$, then what is the value of $(c - a)$?

- (a) $\frac{191}{348}$ (b) $\frac{591}{548}$
(c) $\frac{391}{748}$ (d) $\frac{591}{748}$

4. A and B can do a piece of work in 72 days, B and C can do it in 120 days, A and C can do it in 90 days. In what time can B alone do it?

- (a) 140 days (b) 160 days
(c) 180 days (d) 200 days

5. 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 was the total compound interest on a sum after three years?

Statement I: The interest after one year was Rs 200 and the sum was Rs 5000

Statement II: The difference between simple and compound interest on a sum of Rs 2500 at the end of two years was Rs 100.

- (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) Each statement alone is sufficient

6. Find the value of $\frac{\cot \theta}{\cot \theta - \cot 3\theta} + \frac{\tan \theta}{\tan \theta - \tan 3\theta}$?

- (a) 0 (b) 1
(c) 2 (d) 4

7. A, B and C complete a piece of work in 25, 20 and 24 days respectively. All work together for 3 days and then A and B leave the work. C works for next $5\frac{2}{5}$ days. days and then A along with D joins C and all finish the work in next two days.

If total amount of work be x days, total work done by A, B and C?

- (a) $\frac{43x}{60}$ (b) $\frac{47x}{60}$
(c) $\frac{49x}{60}$ (d) $\frac{51x}{60}$

8. A, B and C complete a piece of work in 25, 20 and 24 days respectively. All work together for 3 days and then A and B leave the work. C works for next $5\frac{2}{5}$ days. days and then A along with D joins C and all finish the work in next two days.

In how many days D alone can complete the whole work?

- (a) $7\frac{5}{13}$ days (b) $12\frac{11}{13}$ days
(c) $11\frac{24}{13}$ days (d) $9\frac{3}{13}$ days

9. In a mixture of 90 L, the ratio of milk and water is 4: 1. If the ratio of milk and water is to be 3: 4 then, how much amount of water is to be further added?

- (a) 58 L (b) 68 L
(c) 78 L (d) 88 L

10. For the data given below:

Class	0-15	15-30	30-45	45-60	60-75	75-90	90-105
Frequency	5	4	9	6	7	8	3

Find which of the following relation is true?

- (a) Median > Mode (b) Median < Mode
(c) Median = Mode (d) None of these

- 11.** For the data given below:

Class	0-15	15-30	30-45	45-60	60-75	75-90	90-105
Frequency	5	4	9	6	7	8	3

Find mean, by using empirical relation?

- (a) 34.7125 (b) 32.7125
(c) 32.8125 (d) 34.8125

- 12.** Consider the following data:

The expenditure (in lakhs of rupees) of a company for the years 2011 to 2017 is as under:

Year	Expenditure
2011	13.8
2012	15.4
2013	10.4
2014	13.1
2015	15.8
2016	17.2
2017	19.4

In which year, the percentage increase in expenditure is maximum as compared to its previous year?

- (a) 2012 (b) 2014
(c) 2015 (d) 2017

13. If M = largest prime factor of $(5^{14} + 5^{13} - 30)$ and N = largest prime factor of $(4^{14} + 4^{13} - 20)$, then what is the value of $(M - N)$?

- (a) 360 (b) 260
(c) 340 (d) 320

- 14.** If $\left\{x + \left(\frac{1}{x}\right)\right\} = 9$, then find the value of

$$\left\{ \mathbf{X}^4 + \left(\frac{1}{\mathbf{X}^4} \right) \right\}.$$

- (a) 6243 (b) 6241
(c) 6239 (d) 6237

15. What is the least number of square tiles required to pave the floor of a room 9 m 99 cm long and 4 m 7 cm broad?

- (a) 247 (b) 277
(c) 297 (d) 307

- 16.** A train crosses a tunnel in 30 seconds and length of tunnel is twice that of train. If speed of train were 5 m/s more and length of train were 20% more, it would take $26\frac{2}{3}$ seconds to cross the tunnel. If a man is walking inside the train at the speed of 5 m/s and cover the length of train in 't' seconds, then find the distance covered by train in 't' seconds?

- (a) 1050 m (b) 1250 m
(c) 1000 m (d) 1500 m

17. The cost of four cricket bats and six cricket balls is Rs. 10,800 whereas the cost of three cricket bats and five cricket balls is Rs. 8,400. Find the cost of five cricket bats.

- (a) Rs 7200 (b) Rs 3000
(c) Rs 5400 (d) Rs 9000

- 18.** If $(125x^3 - 343y^3) \div (5x - 7y) = Ax^2 - By^2 + Cxy$,
then find the value of $(2A + B - C)$.

- (a) -36 (b) -33
(c) -35 (d) -34

19. If $(6m - 5n)^2 = 7$ and $30mn = 60$, then find the value of $(6m + 5n)^2 + 16mn$.

- (a) 295 (b) 269
(c) 275 (d) 279

- 20.** Find the value of

$\log_{10} xy$ if $x = 0.1515151515\dots$ & $y =$

$$\frac{1}{0.12121212121212121212\dots}$$

(Take $\log_{10}2 = 0.310$)

- (a) 0.081 (b) 0.097
(c) 0.054 (d) 0.078

- 21.** The HCF of $(x^3 - x^2 - 2x)$ and $(x^3 + x^2)$ is

- (a) $x^3 - x^2 - 2x$ (b) $x^2 + x + 1$
(c) $x(x + 1)$ (d) $x - 1$

- 22.** If ' y_1 ' and ' y_2 ' are the roots of quadratic equation $5y^2 - 25y + 15 = 0$, then find the quadratic equation whose roots are ' $3y_1$ ' and ' $3y_2$ '.

- (a) $(y^2 - 15y - 27) = 0$ (b) $(y^2 + 15y + 27) = 0$
(c) $(y^2 - 15y + 27) = 0$ (d) $(y^2 + 15y - 27) = 0$

23. The age of a father, before two years, was eight times the age of his son. After 1 year, father's age will be five times the son's age. After how many years from now the ratio of father's age to the son's age is 3:1?
- (a) 4 years (b) 6 years
(c) 8 years (d) 10 years
24. 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: Find the number of males and females in a party.
Statement I: The ratio of males and females is 5:4
Statement II: The number of males is 60% more than the number of females.
- (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.
25. If $a + b + c = 19$, $ab + bc + ca = 114$ and $abc = 216$, find the value of $\left(\frac{2a^2}{a+3} + \frac{3b^2}{b+6} + \frac{4c^2}{c+2}\right)$
- (a) 30.16 (b) 33.16
(c) 35.66 (d) 35.99
26. If $a + b + c = 0$, then $\frac{2c^2}{a^2 + b^2 - c^2} + \frac{2b^2}{c^2 + a^2 - b^2} + \frac{2a^2}{b^2 + c^2 - a^2} + 5$
- (a) 1 (b) 2
(c) 0 (d) 3
27. Find the value of $\sqrt{\frac{1 - \cos \alpha}{1 + \cos \alpha}} \times (\operatorname{cosec} \alpha + \cot \alpha)$?
- (a) 0 (b) 1
(c) 2 (d) 3
28. $(\sec^4 A - \sec^2 A)$ is equal to?
- (a) $\frac{\cos^2 A}{\cos^4 A}$ (b) $\frac{\sin^4 A}{\cos^2 A}$
(c) $\frac{\sin^2 A}{\cos^4 A}$ (d) $\frac{\sin^2 A}{\sin^4 A}$
29. If $\tan(A + B) = 1$ and $\cos(A - B) = \frac{1}{\sqrt{2}}$, $A + B \leq 90^\circ$ and $A > B$, then the value of $\frac{4\operatorname{cosec}^4 A + 5\sec^2 A}{2\cos B \sin^2 A}$?
- (a) 10 (b) 20
(c) 22 (d) 26
30. $(\sec \theta - \cos \theta)(\tan \theta + \cot \theta)(\operatorname{cosec} \theta - \sin \theta)$ is equal to ?
- (a) 0 (b) 1
(c) 2 (d) 4
31. $[2(\sin^6 A + \cos^6 A)] - 3(\sin^4 A + \cos^4 A) + 1$ is equal to:
- (a) 0 (b) 1
(c) 2 (d) 4
32. If $0 < \theta \leq \frac{\pi}{2}$, then which of the following is true?
- (a) $\cos^2 \theta + \frac{1}{\cos^2 \theta} > 2$ (b) $\cos^2 \theta + \frac{1}{\cos^2 \theta} < 2$
(c) $\cos^2 \theta + \frac{1}{\cos^2 \theta} = 2$ (d) None of these
33. The height of a tower is 90 m. The angle of elevation of the top of the hill as seen from the top of the tower is 60° . The horizontal distance between the tower and the hill is 30 m. What is the height (in metres) of the hill?
- (a) $30(1 + \sqrt{3})$ (b) $60\sqrt{3}$
(c) $30(3 + \sqrt{3})$ (d) $30(3 + 2\sqrt{3})$
34. The angle of elevation of the top of an under construction building from a point 225 meters from its base is 30° . Find the height that the building must be raised so that the angle of elevation of the top of the building from the same point be 45° . (Take $\sqrt{3} = 1.73$)
- (a) 96.25 m (b) 95.25 m
(c) 96 m (d) 97.25 m

35. If $\tan^2 A = 2 - B^2$, where A is an acute angle, then find then find the value of $\frac{\tan^3 A}{\sin A} + \frac{1}{\cos A}$

- (a) $(3 - B^2)^{\frac{3}{2}}$ (b) $(B^2 - 1)^{\frac{1}{2}}$
(c) $(B^2 - 3)^{\frac{3}{2}}$ (d) $(B^2 - 2)^{\frac{1}{2}}$

36. A tangent is drawn from a point 'P' to a circle, which meets the circle at Q such PQ = 16 cm. A secant PRS intersects the circle at points 'R' and 'S' If PR = 8 cm, what is the length of the chord RS.

- (a) 32 cm (b) 16 cm
(c) 24 cm (d) 18 cm

37. What is the value of

$$\frac{\cos 72^\circ - 3\cos 156^\circ}{\cos 48^\circ + \cos 96^\circ + \cos 84^\circ + 1} - 2\cos 24^\circ$$

- (a) 3 (b) 1
(c) 0 (d) 2

38. Simplify the following expression:

$$(\operatorname{cosec} X + \cos X)^2 - \frac{1 + \sec X}{\sec X - 1}$$

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

39. If $x^2 + y^2 + z^2 = 2(5x + 6y + 4z) - 77$, then find the value of $2(x + y) - 3z$.

- (a) 12 (b) 20
(c) 10 (d) 15

40. if, $4x^2 + y^2 - 20x - 6y + 34 = 0$, then find the value of

$$\frac{4x+3y}{2x-y}$$

- (a) 9.5 (b) $\frac{18}{5}$
(c) $\frac{22}{7}$ (d) 12.5

41. A red and a blue cone are placed on a table. The radius of the red cone is equal to the height of the blue cone and the height of the red cone is 1.5 times the radius of the blue cone. If the volume of the red and blue cones is 396 cm^3 and 308 cm^3 ,

respectively, what is the ratio of the base perimeter of the red cone to that of the blue cone?

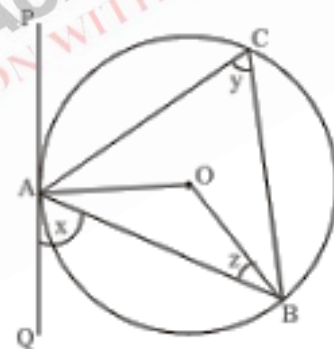
- (a) 2 : 5 (b) 2 : 7
(c) 6 : 7 (d) 8 : 15

42. The surface area of a sphere is $15,400 \text{ cm}^2$. The base radius of a right circular cylinder is half the radius of the given sphere. If the height of the given cylinder is same as the radius of the sphere, then find the total surface area of the given cylinder. (Take $\pi = \frac{22}{7}$)

- (a) $5,225 \text{ cm}^2$ (b) $5,575 \text{ cm}^2$
(c) $5,775 \text{ cm}^2$ (d) $5,650 \text{ cm}^2$

43. 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: In figure given below, PAQ is tangent to the circle, with centre O, at a point A.



What would be value of y ?

Statement I: $\angle x = 68^\circ$

Statement II: $\angle z = 22^\circ$

- (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) Each statement alone is sufficient

44. Chords AB and CD of a circle intersect externally at P. If AB = 6 cm, CD = 3 cm and PD = 5 cm, then PB = ?
 (a) 1 cm (b) 2 cm
 (c) 4 cm (d) 6 cm
45. If P and Q are the roots of the equation $Px^2 - P^2x + PQ = 0$, then what are the value of P and Q respectively?
 (a) (0, 0) (b) (0, 1)
 (c) (1, 0) (d) (1, 1)
46. If x is real, then the minimum value of $\frac{x^2 - 2x^2 + 9x}{x}$?
 (a) 2 (b) 4
 (c) 6 (d) 8
47. The sum of four numbers is 84. If you add 5 to the first number, 3 is subtracted from the second number, the third is multiplied by 7 and the fourth is divided by 3, then all the results are equal. What is the difference between the largest and the smallest of the original numbers?
 (a) $\frac{1365}{16}$ (b) $\frac{1165}{11}$
 (c) $\frac{2365}{16}$ (d) $\frac{2311}{47}$
48. Find the value of P for which the given system of equations has only solution (i.e., unique solution)
 $Px - y = 2; 16x - 8y = 3$
 (a) P = 2
 (b) P can have all real values except 2
 (c) P can have all real values except 3
 (d) None of these
49. If one of the roots of the equation $Ax^2 + Bx + C = 0$, is two and half times the others, then which of the following is True?
 (a) $14B^2 = 49AC$ (b) $10B^2 = 49AC$
 (c) $9B^2 = 49AC$ (d) $10B^2 = 51AC$
50. The marks obtained by the students is given for class A students and class B students:

Marks Obtained	Number of Student for class A	Number of Student for class B
15-20	5	8
20-25	15	30
25-30	20	14
30-35	25	22
35-40	18	5

Which of the following statements is correct?

- (a) The mode for class A is higher than the mode for class B
 (b) The mode for class B is higher than the mode for class A
 (c) Both the class have the same mode
 (d) None of these

51. The marks obtained by the students is given for class A students and class B students:

Marks Obtained	Number of Student for class A	Number of Student for class B
15-20	5	8
20-25	15	30
25-30	20	14
30-35	25	22
35-40	18	5

Find the mean by using the mode of greater class, if median is 15.5?

- (a) 4.17 (b) 6.17
 (c) 8.37 (d) 10.77

52. Answer the following questions for the given frequency distribution for the two series of observations.

Class interval	Frequency series I (S-I)	Frequency series II (S-II)
0-10	5	23
10-20	x	2y
20-30	y	x
30-40	3	13
40-50	9	12
	50	100

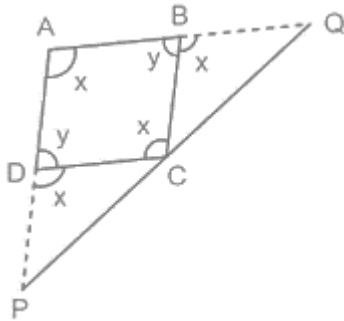
Identify the correct statement regarding mean of the above frequency distributions

- (a) Mean I = 20.3 (b) Mean II = 24.4
 (c) Mean I > Mean II (d) Mean I Mean II

53. If α and β are the roots of the equation $ax^2 + bx + c = 0$, then which equation will have roots $(\alpha\beta + \alpha + \beta)$ and $(\alpha\beta - \alpha - \beta)$?
- (a) $a^2x^2 - 2acx + c^2 - b^2 = 0$
 (b) $a^2x^2 + 2acx + c^2 - b^2 = 0$
 (c) $a^2x^2 + 2acx + c^2 + b^2 = 0$
 (d) $a^2x^2 - 2acx^2 - b^2 = 0$
54. If α and β are the roots of the quadratic equation, $x^2 - 2x - 1 = 0$. What is the value of $\alpha^8 + \beta^8$?
- (a) 1124 (b) 1154
 (c) 1174 (d) 1194
55. Thrice the surface area of sphere is equal to twice the surface area of cube. What is the ratio of the square of volume of the sphere to the square of volume of the cube?
- (a) $\pi : 6$ (b) $1 : 1$
 (c) $16 : \pi$ (d) $3 : \pi$
56. A hemispherical bowl of internal radius 20 cm contains sauce. The sauce is to be filled in conical-shaped bottles of radius cm and height 8cm. What is the number of bottles required?
- (a) 100 (b) 90
 (c) 80 (d) 75
57. ABC is a triangle in which $AB = AC$. Let BC be produced to D. From a point E on the line AC let EF be a straight line. such that EF is parallel to AB. Consider the quadrilateral ECDF thus formed. If $\angle ABC = 65^\circ$ and $\angle EFD = 80^\circ$, then what is $\angle FDC$ equal to?
- (a) 43° (b) 41°
 (c) 37° (d) 35°
58. What is the compound interest (in Rs.) on a sum of Rs.8192 for $1\frac{1}{4}$ years at 15% p.a, if interest is compounded 5 monthly?
- (a) 1740 (b) 1735
 (c) 1634 (d) 1640
59. ABCD is a parallelogram. If the bisectors of the angle A and angle C meet the diagonal BD at points P and Q respectively, then which one of the following is correct?
- (a) PCQA is a straight line
 (b) Triangle APQ is similar to triangle PCQ
 (c) $AP = CP$
 (d) $AP = AQ$
60. If the circumference of a circle is half of the perimeter of square, then which one of the following is correct?
- (a) Area of circle = Area of square
 (b) Area of circle $\geq$ Area of square
 (c) Area of circle < Area of square
 (d) Area of circle > Area of square
61. The number of sides of two regular polygons are in the ratio 5: 4. The difference between their interior angles is 9° . Consider the following statements
- One of them is a pentagon and the other is a rectangle.
 - One of them is a decagon and the other is an octagon.
 - The sum of their exterior angles is 720° .
- Which of the above statements is/are correct?
- (a) 1 only (b) 2 only
 (c) 1 and 3 (d) 2 and 3
62. If the area of an equilateral triangle is x and its perimeter is y, then which one of the following is correct?
- (a) $y^4 = 432 x^2$ (b) $y^4 = 216 x^2$
 (c) $y^2 = 432 x^2$ (d) None of the above
63. A lawn 30 m long and 16 m wide is surrounded by a path 2 m wide. What is the cost of paving the path at the rate of Rs 15 per square metre?
- (a) Rs 3000 (b) Rs 2800

- (c) Rs 3200 m² (d) Rs 3200

64. ABCD is a rhombus. A straight line through C cuts AD produced at P and AB produced at Q. If $DP = \frac{1}{2}AB$, then the ratio of the length of BQ and AB is



- (a) 2 : 1 (b) 1 : 2
(c) 1 : 1 (d) 3 : 1
65. A B C D is a rectangle. Let E be a point on AB and F a point on CD such that DE is parallel to BF. If AE = 4 cm and if the area of triangle BFC=6 square cm. Consider the following statements:
- Area of rectangle A B C D can be of the form pq^2 square cm where p, q are distinct primes.
 - Area of the figure EBFD is of the form r^2 square cm where r is rational but not an integer.
- Which of the above statements is/are correct?
- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
66. There are twelve friends A, B, C, D, E, F, G, H, I, J, K and L who invested money in some business in the ratio of 1: 2: 3: 4: 5: 6: 7: 8: 9: 10: 11: 12 and the duration for which they invested the money is in the ratio of 12: 11: 10: 9: 8: 7: 6: 5: 4: 3: 2: 1 respectively. Who will get the maximum profit at the end of the year?
- (a) F only (b) G only
(c) Both F and G (d) Neither F nor G
67. A square, a circle and an equilateral triangle have same perimeter. Consider the following statements:

- The area of square is greater than the area of the triangle.
 - The area of circle is less than the area of triangle.
- Which of the statements is/are correct?

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

68. In a triangle ABC, $\angle BCA = 90^\circ$ and CD is perpendicular to AB. If AD = 6 cm and BD = 9 cm, then the value of DC will be
- (a) 6.2 cm (b) 5.5 cm
(c) 6.5 cm (d) 7.35 cm
69. In a survey, 80 people were asked if they watch TV, read books, or use the internet regularly. The results were as follows: 40 people watch TV, 50 people read books, and 60 people use the internet. If 20 people watch TV and read books, 25 people read books and use the internet, and 30 people use the internet and watch TV, how many people in the survey do all three activities?
- (a) 10 (b) 15
(c) 25 (d) 5
70. A right circular cylinder is formed. A = sum of total surface area and the area of the two bases. B = the curved surface area of this cylinder. If $A / B = 3/2$ and the volume of cylinder is 4312 cm^3 , then what is the sum of area (in cm^2) of two bases of this cylinder?
- (a) 154 (b) 308
(c) 462 (d) 616
71. The ratio of total surface area and volume of sphere is 1:7. This sphere is melted to form small spheres of equal size. The radius of each small sphere is % the radius of the large sphere. What is the sum (in cm^2) of curved surface areas of small sphere?
- (a) 31276 (b) 36194
(c) 25182 (d) 33264

72. The ratio of acid and water in vessels A and B is 4 : 5 and 23, respectively. Six litres of solution from A, 2 litres from B are mixed in vessel C. What is the ratio of acid and water in solution in vessel C?

- (a) 5:9 (b) 15:11
(c) 13:17 (d) 11:9

73. What are the values of c when the HCF of $x^3 + cx^2 - x + 2c$ and $x^2 + cx - 2$ over the rationals is a linear polynomial?

- (a) ± 1 (b) ± 2
(c) ± 3 (d) ± 4

74. $x = 999$, $y = 1000$, $z = 1001$, then the value of $\frac{x^3 + y^3 + z^3 - 3xyz}{x - y + z}$ is?

- (a) 1000 (b) 9000
(c) 1 (d) 9

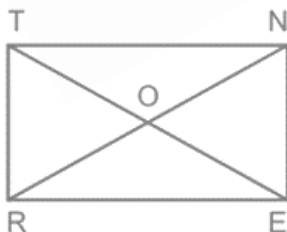
75. In a $\triangle ABC$, right angled at B, $AB + BC = 10(1 + \sqrt{3})$ cm and length of the hypotenuse is 20 cm. What is the value of $\tan A + \tan C$.

- (a) $\frac{4}{\sqrt{3}}$ (b) $\frac{2}{\sqrt{3}}$
(c) $\sqrt{3}$ (d) $2\sqrt{3}$

76. If $a \sec \theta + b \tan \theta + c = 0$ and $p \sec \theta + q \tan \theta + r = 0$, then $(br - qc)^2 - (pc - ar)^2 = ?$

- (a) $(aq - bp)^2$ (b) $(ap - bq)^2$
(c) $(aq + bp)^2$ (d) $(aq - bp)^3$

77. RENT is a rectangle, its diagonals meet at O. Find x , if $OR = 2x + 4$ and $OT = 3x + 1$ (such that $OT = OR$)



- (a) 4 (b) 3
(c) 6 (d) 5

78. If the root of the equation $\frac{x(x-1)-(m+1)}{(x-1)(m-1)} = \frac{x}{m}$

are equal, then what is the value of m ?

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

79. Rs.720 was divided among A, B, C, D, E. The sum received by them was in ascending order and in arithmetic progression. E received Rs.40 more than A. How much did B receive?

- (a) Rs.134 (b) Rs.154
(c) Rs.144 (d) Rs.124

80. What is the least integral value of k for which the equation $x^2 - 2(k-1)x + (2k+1)$ has both the roots are positive?

- (a) 1 (b) $-1/2$
(c) 4 (d) 0

81. Find the sum of the factors of 3240

- (a) 10890 (b) 11000
(c) 10800 (d) 10190

82. By increasing the speed of his car by 15 km/hour, a person covers 300 km distance by taking an hour less than before. The original speed of the car was?

- (a) 45 km/hour (b) 50 km/hour
(c) 60 km/hour (d) 75 km/hour

83. On selling 38 balls at Rs.2240, there is a loss of CP of 6 balls. CP of 1 ball is?

- (a) 50 (b) 60
(c) 70 (d) 40

84. For what value of k , will the roots of the equation $kx^2 - 5x + 6 = 0$ be in the ratio of 2 : 3?

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

85. A toy is in the form of a cone mounted on the hemisphere with the same radius. The diameter of the base of the conical portion is 12 cm and its height is 8 cm. What is the volume of the toy?

(a) $180\pi \text{ cm}^3$ (b) $240\pi \text{ cm}^3$

(c) $300\pi \text{ cm}^3$ (d) 320 cm^3

86. ABC is a triangle and the perpendicular drawn from A meets BC in D. If $AD^2 = BD$, then which one of the following is correct?

(a) ABC must be an obtuse angled triangle

(b) ABC must be an acute angled triangle

(c) Either $\angle B \geq 45^\circ$ or $\angle C \geq 45^\circ$

(d) $AC^2 = AB^2 + BC^2$

87. If $\frac{4}{x+y} + \frac{6}{x-y} = 2$ and $\frac{12}{x+y} - \frac{4}{x-y} = 4$ then

what is $\frac{x}{y}$ equal to?

(a) $3/2$

(b) $\frac{-5}{3}$

(c) $2/3$

(d) $1/5$

88. What is the value of k that $(2x - 1)$ may be a factor of $4x^4 - (k - 1)x^3 + kx^2 - 6x + 1$?

(a) 8

(b) 9

(c) 12

(d) 13

89. Consider the following data for the question below.
What will be the median?

Class	Frequency(f)
0-10	8
10-20	7
20-30	6
30-40	9
40-50	11
50-60	13
60-70	4
70-80	2
80-90	10
	Total=70

(a) 44.45

(b) 44.54

(c) 54.45

(d) 55.54

90. Read the following information and answer the two items below-

Year	No. of tigers in P1	No. of tigers in P2	No. of tigers in P3
2017	406	340	308
2018	456	370	328
2019	472	397	364
2020	503	413	398

The following data shows the number of tigers in different national parks in various years.

(a) P_2

(b) P_1

(c) P_3

(d) None

91. The marks of the students of a class who appeared for a test in English are represented in the following frequency table:

Class interval	1-10	11-20	21-30	31-40	41-50	51-60	
Frequency	9	22	-	20	12	8	100 (Total frequency)

What is/are the modal class(es)?

(a) 10.5 - 20.5 only.

(b) 20.5-30.5 only

(c) 10.5-20.5 and 20.5 - 30.5

(d) there is no modal class

92. What is one of the square roots of $16x^6 - 24x^5 + 25x^4 - 20x^3 + 10x^2 - 4x + 1$?

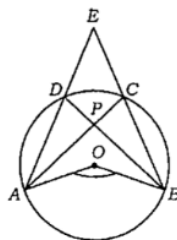
(a) $4x^3 - 3x^2 + 2x + 1$ (b) $4x^3 - 3x^2 - 2x - 1$

(c) $4x^3 - 3x^2 + 2x - 1$ (d) $4x^3 - 3x^2 - 2x + 1$

93. ABCD is a quadrilateral, the sides of which touch a circle. Which one of the following is correct?

(a) $AB + AD = CB + CD$ (b) $AB : CD = AD : BC$

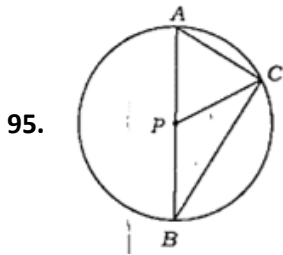
(c) $AB + CD = AD + BC$ (d) $AB : AD = CB : CD$



94.

In the figure given above, O is the centre of the circle. AC and BD intersect at P. If $\angle AOB = 100^\circ$ and $\angle DAP = 30^\circ$, what is $\angle APB$?

- (a) 77° (b) 80°
(c) 85° (d) 90°

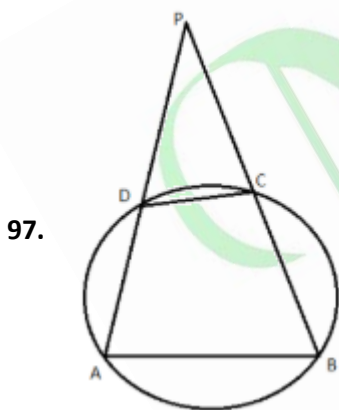


In the figure given above, A and B are end points of diameter of a circle with centre at P, and C is a point on the circumference of the circle such that $\angle ABC = 35^\circ$, then what is $\angle PCA$?

- (a) 25° (b) 30°
(c) 35° (d) 55°

96. What is the radius of the circle inscribed in a triangle having side lengths 35 cm, 44 cm and 75 cm?

- (a) 3 cm (b) 4 cm
(c) 5 cm (d) 6 cm



In the figure given above, if $\angle BAD = 60^\circ$, $\angle ADC = 105^\circ$, then what is $\angle DPC$ equal to?

- (a) 40° (b) 45°
(c) 50° (d) 60°

98. A circular ring with center O is kept in the vertical position by two weightless thin strings TP and TQ attached to the ring at P and Q. The line OT meets the ring at E whereas a tangential string at E meets TP and TQ at A and B respectively. If the radius of the ring is 5 cm and $OT = 13$ cm, then what is the length of AB?

- (a) $10/3$ cm (b) $20/3$ cm
(c) 10 cm (d) $40/3$ cm

99. Consider a circle with a center at O and Radius r. Points A and B lie on its circumference and a point M lies outside of it such that M, A and O lie on the same straight line. Then the ratio of MA to MB is

- (a) equal to r (b) equal to 1
(c) greater than 1 (d) less than 1

100. Consider the Following statements:

1. The tangent of a circle is a line that meets the circle in one and only one point.
2. The tangent of a circle at the end point of the diameter is perpendicular to the diameter.

Which of the above statements are correct?

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