MODEL PAPER - 6

MATHEMATICS

1. If $z = \frac{1-i\sqrt{3}}{1+i\sqrt{3}}$, then principal amplitude of z is *(Complex Numbers)*

1) $\frac{-2\pi}{3}$ 2) $\frac{-\pi}{3}$ 3) $\frac{\pi}{3}$ 4) $\frac{2\pi}{3}$

2. $\lim_{\alpha\to\beta} \frac{\sin^2\alpha - \sin^2\beta}{\alpha^2-\beta^2}$ is equal to *(Limits)*

1) 0 2) 1 3) $\frac{\sin\beta}{\beta}$ 4) $\frac{\sin 2\beta}{2\beta}$

3. If $x = \exp\left\{\mathrm{Tan}^{-1}\left(\frac{y-x^2}{x^2}\right)\right\}$, then $\frac{dy}{dx}$ = *(Differention)*

1) $2x[1+\tan(\log x)]+\sec^2(\log x)$ 2) $x[1+\tan(\log x)]+\sec^2(\log x)$

3) $2x[1+\tan(\log x)]+x^2\sec^2(\log x)$ 4) $2x[1+\tan(\log x)]+x\sec^2(\log x)$

4. The denominator of a function is greater than 16 of the square of the numerator, then least value of the function is *(Differention)*

1) $\frac{-1}{4}$ 2) $\frac{-1}{8}$ 3) $\frac{1}{\sqrt{2}}$ 4) $\frac{1}{16}$

5. If $\int f(x)\cos x\,dx = \frac{1}{2}f^2(x)+c$, then f(x) can be *(Integration)*

1) x 2) 1 3) cosx 4) sinx

6. The parabolas $y^2 = 4x$ and $x^2 = 4y$ divide the square region bounded by the lines x = 4, y = 4 and the coordinate axes into three parts s_1, s_2, s_3 numbered from top to bottom. If s_1, s_2, s_3 represent the areas of the above parts, then $s_1 : s_2 : s_3$ equals *(Parabola)*

1) 1 : 1 : 1 2) 2 : 1 : 2 3) 1 : 2 : 3 4) 1 : 2 : 1

7. $(1^2) + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \ldots\ldots$ n brackets = *(Mathematical Induction)*

1) $\frac{n(n+1)(n+2)}{6}$ 2) $\frac{n(n+1)^2(n+2)}{12}$ 3) $\frac{n(n+1)(n+2)^2}{4}$ 4) $\frac{n(n+1)(2n+1)}{6}$

8. $f(x) = \begin{cases} -1, & -2 \le x \le 0 \\ x-1, & 0 < x \le 2 \end{cases}$ then $\{x \in [-2, 2] ; x \ge 0 : |f(x)| = x\}$ = *(Functions)*

1) {0} 2) $\left\{\frac{1}{2}\right\}$ 3) {1} 4) ϕ

9. Let $f:(-1, 1) \to B$ be a function defined by $f(x) = \mathrm{Tan}^{-1}\left(\frac{2x}{1-x^2}\right)$ then f is both one one and onto when B is the interval *(Functions)*

1) $\left(0, \frac{\pi}{2}\right)$ 2) $\left[0, \frac{\pi}{2}\right)$ 3) $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ 4) $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

10. The position vectors of the points A, B, C are $\bar{i} + \bar{j} + \bar{k}$, $\bar{i} + 5\bar{j} - \bar{k}$ and $2\bar{i} + 3\bar{j} + 5\bar{k}$ respectively the greatest angle of ΔABC is *(Vectors)*

1) 90^0 2) 135^0 3) 120^0 4) $\mathrm{Cos}^{-1}\left(\frac{5}{7}\right)$

11. Vector equation of perpendicular bisector of $A(\bar{a})$ and $B(\bar{b})$ is *(Vectors)*

1) $\bar{r} = (1-t)\bar{a} + t\bar{b}$ 2) $\bar{r} = \bar{a} + t\bar{b}$ 3) $\left(\bar{r} - \frac{\bar{a}+\bar{b}}{2}\right).(\bar{a}-\bar{b}) = 0$ 4) $\left(\bar{r} - \frac{\bar{a}-\bar{b}}{2}\right).(\bar{a}+\bar{b}) = 0$

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12. Length of perpendicular from the origin to the plane passing through the point A($\bar{a}$) and containing the line $\bar{r} = \bar{b} + \lambda\bar{c}$ is *(Vectors)*

1) $\dfrac{[\bar{a}\ \bar{b}\ \bar{c}]}{|\bar{a} \times \bar{b} + \bar{b} \times \bar{c} + \bar{c} \times \bar{a}|}$ 2) $\dfrac{[\bar{a}\ \bar{b}\ \bar{c}]}{|\bar{a} \times \bar{b} + \bar{b} \times \bar{c}|}$ 3) $\dfrac{|[\bar{a}\ \bar{b}\ \bar{c}]|}{|\bar{b} \times \bar{c} + \bar{c} \times \bar{a}|}$ 4) $\dfrac{[\bar{a}\ \bar{b}\ \bar{c}]}{|\bar{c} \times \bar{a} + \bar{a} \times \bar{b}|}$

13. Volume of the tetrahedron with edges $\bar{i} + 2\bar{j} + 2\bar{k},\ 2\bar{i} - \bar{j} + 2\bar{k},\ 2\bar{i} + 2\bar{j} - \bar{k}$. *(Vectors)*

1) $\frac{9}{2}$ cubic units 2) $\frac{7}{2}$ cubic units 3) $\frac{10}{2}$ cubic units 4) $\frac{13}{2}$ cubic units

14. **Assertion (A):** For any vector $\bar{a}$, $|\bar{a} \times \bar{i}|^2 + |\bar{a} \times \bar{j}|^2 + |\bar{a} \times \bar{k}|^2 = 2|\bar{a}|^2$. *(Vectors)*

Reason (R): For any vectors $\bar{a}, \bar{b}$ and $\bar{c}$, $[\bar{a}\ \bar{b}\ \bar{c}] = (\bar{a} \times \bar{b}).\bar{c}$

Then the correct statement is
1) Both **A** and **R** are true and **R** is the correct explanation of **A**
2) Both **A** and **R** are true and **R** is not the correct explanation of **A**
3) **A** is true and **R** is false 4) **A** is false and **R** is true

15. $\bar{a} = 2\bar{i} - 3\bar{j},\ \bar{b} = \bar{i} + \bar{j} - \bar{k},\ \bar{c} = 3\bar{i} - \bar{k}$. *(Vectors)*

Match the following

List - I	List II
i) $[\bar{a}\ \bar{b}\ \bar{c}]$	a) $\frac{2}{3}$
ii) $[\bar{b}+\bar{c}\ \ \bar{c}+\bar{a}\ \ \bar{a}+\bar{b}]$	b) 16
iii) $[\bar{b}\times\bar{c}\ \ \bar{c}\times\bar{a}\ \ \bar{a}\times\bar{b}]$	c) 8
iv) Volume of the tetrahedron with $\bar{a}, \bar{b}, \bar{c}$ as coterminous edges is	d) 4

The correct match from list I to II is
1) d, c, b, a 2) b, c, a, d 3) c, d, a, b 4) d, b, c,a

16. A = $[a_{ij}]_{n\times n}$ such that $a_{ij} = (i + j)^2$ and trace of A = 120 then n = *(Matrices)*

1) 3 2) 6 3) 5 4) 4

17. If $n \in Z$, the value of $\begin{vmatrix} n^2 & (n+1)^2 & (n+2)^2 \\ (n+3)^2 & (n+4)^2 & (n+5)^2 \\ (n+6)^2 & (n+7)^2 & (n+8)^2 \end{vmatrix}$ is *(Matrices)*

1) - 8 2) 8 3) - 216 4) - 108

18. The system of n equations in 'n' unknowns expressed in the form of AX = B has infinitely many solutions if *(Matrices)*

1) $|A| \neq 0$ 2) $|A| \neq 0$, (adj A) B $\neq$ O 3) $|A| = 0$, (adj A) B = O 4) $|A| \neq 0$, (adj A) B = O

19. The value of $\sqrt{1-\cos^2 100^0}.\operatorname{cosec} 100^0 + \sqrt{1-\sin^2 100^0}.\sec 100^0$ = *(Trignomentry)*

1) 0 2) 2 3) 1 4) -2

20. If 3 sec α - 5 tan α = k, 6 sec α + k tan α = 5 then k^2 = *(Trignomentry)*

1) 34 2) 70 3) 14 4) 20

21. If sin 2θ = k then $\dfrac{\tan^3\theta}{1+\tan^2\theta} + \dfrac{\cot^3\theta}{1+\cot^2\theta}$ = *(Trignomentry)*

1) $\frac{1-k^2}{k}$ 2) $\frac{2-k^2}{k}$ 3) $\frac{1+k^2}{k}$ 4) $\frac{2+k^2}{k}$

22. Period of $\sin\frac{\pi x}{2} + 2\cos\frac{\pi x}{3} - \tan\frac{\pi x}{4}$ is *(Trignomentry)*

1) 12 2) 24 3) 16 4) 15

23. $\sin\frac{\pi}{5}\ \sin\frac{2\pi}{5}\ \sin\frac{3\pi}{5}\ \sin\frac{4\pi}{5}$ = *(Trignomentry)*

1) $\frac{2}{16}$ 2) $\frac{1}{16}$ 3) $\frac{3}{16}$ 4) $\frac{5}{16}$

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24. The number of solutions of the equation $\cot^2 x - \left(\sqrt{3}+1\right)\cot x + \sqrt{3} = 0$ in the interval $\left(0, \frac{\pi}{2}\right)$ *(Trignomentry Equation)*

1) 2 2) 3 3) 4 4) 0

25. The value of $\tan\left(2Tan^{-1}\frac{1}{5} - \frac{\pi}{4}\right) =$ *(Inverse Trignomentry)*

1) $\frac{7}{17}$ 2) $-\frac{5}{17}$ 3) $\frac{5}{17}$ 4) $-\frac{7}{17}$

26. If $\sin\alpha \cos h\beta = \cos\theta$ and $\cos\alpha \sinh\beta = \sin\theta$ then $\sin h^2 \beta =$ *(Hyperbolic Function)*

1) $\cos\alpha$ 2) $\cos^2\alpha$ 3) $\sin\alpha$ 4) $\sin^2\alpha$

27. In ΔABC, if $2a^2 + 4b^2 + c^2 = 4ab + 2ac$ then $\cos B =$ *(Properties of Triangle)*

1) $\frac{7}{8}$ 2) $\frac{5}{8}$ 3) $\frac{3}{8}$ 4) $\frac{1}{8}$

28. In ΔABC, if $\frac{s-a}{11} = \frac{s-b}{12} = \frac{s-c}{13}$ then $\tan^2\frac{A}{2} =$ *(Properties of Triangle)*

1) $\frac{11}{39}$ 2) $\frac{13}{33}$ 3) $\frac{12}{37}$ 4) $\frac{33}{13}$

29. In ΔABC, $r_1 = 2r_2 = 3r_3$ then $\angle A =$ *(Properties of Triangle)*

1) $\frac{\pi}{3}$ 2) $\frac{\pi}{4}$ 3) $\frac{\pi}{2}$ 4) $\frac{2\pi}{3}$

30. Sum of 99th powers of the roots of the equation $x^7 - 1 = 0$ is *(De-Moiver's Theroem)*

1) 0 2) 99 3) - 99 4) 693

31. **Statement I:** $x^2 - 2x + 10$ has minimum value at $x = 1$ *(Quadratic expression)*

Statement II: $2x - 7 - 5x^2$ has maximum value at $x = 1$

1) Only I is true 2) Only II is true 3) Both I and II are true 4) Neither I nor II is true

32. $\sec\alpha$, $\operatorname{cosec}\alpha$ are roots of $x^2 - px + q = 0$ then *(Quadratic expression)*

1) $p^2 = q(q - 2)$ 2) $p^2 = q(q + 2)$ 3) $p^2 + q^2 = 2q$ 4) $p^2 + q^2 = 2p$

33. α, β, γ are roots of the equation $x^3 - 3x + 1 = 0$ then the equation whose roots are $\alpha - \frac{1}{\beta\gamma}, \beta - \frac{1}{\gamma\alpha}, \gamma - \frac{1}{\alpha\beta}$ *(Theory expression)*

1) $x^3 - 3x + 8 = 0$ 2) $x^3 - 12x + 8 = 0$ 3) $x^3 - 6x + 8 = 0$ 4) $x^3 - 9x + 8 = 0$

34. Exponent of 7 in 100! is *(Permutaion & Combination)*

1) 97 2) 24 3) 14 4) 16

35. There are 3 different books on economics, 4 different books on political science and 5 different books on geography. Total number of selections with atleast one book on each subject is *(Permutaion & Combination)*

1) 4095 2) 4096 3) 3255 4) 3254

36. The term independent of x in the expansion of $\left(\frac{2\sqrt{x}}{5} - \frac{1}{2x\sqrt{x}}\right)^{11}$ is *(Binomial Theorem)*

1) 8th term 2) 6th term 3) 5th term 4) does not exist

37. If C_r stands for ${}^nC_r$ and $\sum_{r=1}^{n} r.\frac{C_r}{C_{r-1}} = 210$ then n = *(Binomial Theorem)*

1) 19 2) 20 3) 21 4) 10

38. If $\frac{3x^3 - 8x^2 + 10}{(x-1)^4} = \frac{A}{x-1} + \frac{B}{(x-1)^2} + \frac{C}{(x-1)^3} + \frac{D}{(x-1)^4}$, then the descending order of A, B, C, D is *(Partial Fractions)*

1) C, B, A, D 2) D, A, C, B 3) D, B, A, C 4) D, A, B, C

39. Variance of 20 observations is 5. If each observations is increased by 2, the variance of the resulting observations is *(Measure of Dispersion)*

1) 0.2 2) 5 3) 10 4) 20

40. A team of 8 couples (husband and wife) attend a lucky draw in which 4 persons picked up for a prize. Then the probability that there is atleast one couple is *(Probability)*

1) $\frac{11}{39}$ 2) $\frac{8}{13}$ 3) $\frac{5}{13}$ 4) $\frac{14}{39}$

41. Two numbers are selected randomly from the set S = {1, 2, 3, 4, 5, 6} without replacement one by one. The probability that minimum of the two numbers is less than 4 is *(Probability)*

1) $\frac{1}{15}$ 2) $\frac{1}{5}$ 3) $\frac{4}{5}$ 4) $\frac{3}{5}$

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42. Three numbers are chosen at random without replacement from {1, 2, 3, ...10}. The probability that minimum of the chosen numbers is 3 or their maximum is 7 is *(Probability)*

1) $\frac{11}{30}$ 2) $\frac{11}{40}$ 3) $\frac{13}{40}$ 4) $\frac{1}{7}$

43. X follows a binomial distribution with parameters n = 8 and p = $\frac{1}{2}$ then $P(|X - 4| \le 2)$ = *(Random Variables)*

1) $\frac{118}{128}$ 2) $\frac{119}{128}$ 3) $\frac{117}{128}$ 4) $\frac{121}{128}$

44. A person who throws a die gains two points for getting an even number and loses one point for getting an odd number. If 4 dice are rolled and total score X is observed then the range of X is *(Random Variables)*

1) {-4, 5, 8} 2) {-4, -1, 0, 5, 8} 3) {-4, -1, 2, 5, 8} 4) {-4, -2, -1, 2, 5, 8}

45. If the vertices P, Q, R of a triangle are rational points, which of the following points of the triangle PQR is always rational point ? *(2D)*

1) centroid 2) incentre 3) orthocentre 4) circumcentre

46. The locus of the point of intersection of the lines $x \sin\theta + (1 - \cos\theta) y = a \sin\theta$, $x \sin\theta - (1 + \cos\theta) y + a \sin\theta = 0$ is *(Locus)*

1) parabola 2) ellipse 3) straight line 4) circle

47. When origin is shifted to suitable point the equation xy + 3x - 4y = c transforming as XY= 10 then c = *(Transformation of axis)*

1) 22 2) -22 3) 2 4) -2

48. Each side of square is of length 4. The centre of the square is (3, 7) and one of its diagonals is parallel to y = x. Then the coordinates of its vertices are *(Straight Lines)*

1) (2, 5), (2, 7), (4, 7), (4, 4) 2) (2, 5), (2, 6), (3, 5), (3, 6)
3) (1, 5), (1, 9), (5, 9), (5, 5) 4) (1, 5), (1, 9), (4, 7), (4, 4)

49. The length of the perpendicular from the point (0, 0) to the striaght line passing through P(1, 2) such that P bisects the intercepted portion between the axes is *(Straight Lines)*

1) $\sqrt{5}$ 2) $\frac{4}{\sqrt{5}}$ 3) 4 4) $\frac{\sqrt{5}}{4}$

50. If the acute angle between the lines 2x - 3y +1 = 0, kx + 5y - 6 = 0 is $\frac{\pi}{4}$ then k = *(Straight Lines)*

1) 1 2) 2 3) - 1 4) - 2

51. The centroid of the triangle formed by the lines $x^2 + xy - 2y^2 = 0$, x + y + 2 = 0 *(Pair of Straight Lines)*

1) $\left(\frac{5}{3},\frac{1}{3}\right)$ 2) $\left(\frac{-5}{3},\frac{1}{3}\right)$ 3) $\left(\frac{5}{3},\frac{-1}{3}\right)$ 4) $\left(\frac{-5}{3},\frac{-1}{3}\right)$

52. If y = mx bisects the angle between the lines $x^2(\tan^2\theta + \cos^2\theta) + 2xy\tan\theta - y^2\sin^2\theta = 0$. If $\theta = \frac{\pi}{3}$, the value of $\sqrt{3}m^2 + 4m$ is *(Pair of Straight Lines)*

1) 1 2) $\frac{1}{\sqrt{3}}$ 3) $\sqrt{3}$ 4) $7\sqrt{3}$

53. If $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a pair of parallel lines then $\sqrt{\frac{g^2 - ac}{f^2 - bc}}$ = *(Pair of Straight Lines)*

1) $\frac{a}{b}$ 2) $\frac{b}{a}$ 3) $\sqrt{\frac{b}{a}}$ 4) $\sqrt{\frac{a}{b}}$

54. P, Q, R, S, T are five collinear points such that PQ = QR = RS = ST and P = (x_1, y_1, z_1) and T = (x_2, y_2, z_2) then the point $\left(\frac{5x_2+3x_1}{8},\frac{5y_2+3y_1}{8},\frac{5z_2+3z_1}{8}\right)$ is midpoint of *(3D)*

1) PQ 2) QR 3) RS 4) ST

55. The angle between the lines whose direction cosines are given by the equations $3\ell + m + 5n = 0$ and $6mn - 2\ell n + 5\ell m = 0$ is *(Direction Cosines)*

1) $\cos^{-1}\left(\frac{1}{3}\right)$ 2) $\cos^{-1}\left(\frac{1}{6}\right)$ 3) $\cos^{-1}\left(\frac{2}{3}\right)$ 4) $\cos^{-1}\left(\frac{5}{6}\right)$

56. The equation of the plane through the point (-1, 6, 2) and perpendicular to the planes x + 2y + 2z - 5 = 0 and 3x + 3y + 2z - 8 = 0 is *(Plane)*

1) 2x - 4y + 3z + 20 = 0 2) 2x + y - 3z + 26 = 0 3) 2x - 4y + 3z + 23 = 0 4) 2x + 5y - 2z + 12 = 0

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57. $\underset{x\to 0}{Lt}\dfrac{1-\cos(1-\cos x)}{x^4}=$ ***(Limits)***

1) $\frac{1}{2}$ 2) $\frac{1}{4}$ 3) $\frac{1}{8}$ 4) $\frac{1}{16}$

58. If f(x) is continuous in [0, 1] and $f\left(\frac{1}{3}\right)=1$ then $\underset{n\to\infty}{Lt} f\left(\frac{n}{\sqrt{9n^2+1}}\right)=$ ***(Continuous)***

1) 1 2) 0 3) 1/3 4) 2

59. f : R → R is a function such that f(1) = 2, f(2) = 6, and f(x+y) = f(x) + kxy - 2y² for all x, y ∈R then ***(Functions)***

1) $f'(x)=f(x)$ 2) $f'(x)=6f(x)$ 3) $f'(x)=6$ 4) $f'(x)=6x$

60. The radius and height of a cylinder are equal to the radius of a sphere. The ratio of the rates of change of volumes of the sphere and cylinder respectively is ***(Rate of Changes)***

1) 3 : 4 2) 2 : 3 3) 3 : 2 4) 4 : 3

61. The tangent to the curve $y = x^3 - 6x^2 + 9x + 4$, $0 \le x \le 5$ has minimum slope at (x_1, y_1) then x_1 = ***(Tangents & Normals)***

1) 2 2) 3 3) 4 4) 5

62. The tangent drawn to the ellipse $\frac{x^2}{64}+\frac{y^2}{49}=1$ cuts the coordinate axes at A, B. Then least length of AB is ***(Ellipse)***

1) 40 2) 30 3) 15 4) 225

63. Semi vertical angle of a cone is 45^0, and height is 30.05 cm, then which of the following are true? ***(Errors)***

Statement I: Error in volume is 45π.

Statement II: Percentage error in volume is $\frac{1}{2}$.

1) Only I 2) Only II 3) both I & II 4) neither I nor II

64. The value of c for which the conclusion of mean value theorem holds for the function f(x) = $\log_e x$ on the interval [1, 3] is ***(Mean Value Theorem)***

1) $\frac{1}{2}\log_e 3$ 2) $2\log_3 e$ 3) $\log_3 e$ 4) $\log_e 3$

65. If the relation between subnormal SN and subtangent ST at any point on the curve $by^2 = (x + a)^3$ is $p(SN) = q(ST)^2$, then $\frac{p}{q}$ = ***(Tangents & Normals)***

1) $\frac{8b}{27}$ 2) $\frac{27}{8b}$ 3) $\frac{27b}{8}$ 4) $\frac{8}{27b}$

66. **Assertion (A):** Both sin x and cos x are decreasing functions in the interval $\left(\frac{\pi}{2},\pi\right)$. ***(Maxima & Minima)***

Reason (R): If a differentiable function decreases in an interval (a, b) then its derivative also decreases in (a, b).

1) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**
2) Both **(A)** and **(R)** are true and **(R)** is not the correct explanation of **(A)**
3) **(A)** is true and **(R)** is false 4) **(A)** is false and **(R)** is true

67. The length of the intercept cut by the circle $x^2 + y^2 - 7x + 5y + 12 = 0$ on the x-axis is ***(Circles)***

1) 3 2) 1 3) 4 4) 2

68. The angle between the pair of tangents from (13, 0) to the circle $x^2 + y^2 = 25$ is ***(Circles)***

1) $\cos^{-1}\left(\frac{5}{12}\right)$ 2) $\tan^{-1}\left(\frac{5}{12}\right)$ 3) $2\cos^{-1}\left(\frac{5}{12}\right)$ 4) $2\tan^{-1}\left(\frac{5}{12}\right)$

69. The radical axis of two non-intersecting circles divides the line segment joining the centres of circles in the ratio ***(Systemof Circles)***

1) of their areas 2) of their radii 3) 1 : 1 4) 1 : -1

70. If the slopes of normals at P(8, 8), Q(2, -4), R(8, -8) on parabola $y^2 = 8x$ are m_1, m_2, m_3 then ascending order of m_1, m_2, m_3 is ***(Parabola)***

1) m_1, m_2, m_3 2) m_1, m_3, m_2 3) m_3, m_1, m_2 4) m_2, m_3, m_1

71. The equation to the directrix of the parabola $x^2 + 8x + 12y + 4 = 0$ is ***(Parabola)***

1) x - 4 = 0 2) x + 4 = 0 3) y - 4 = 0 4) y + 4 = 0

72. The latusrectum of an ellipse is $\frac{1}{3}$ of the major axis. Its eccentricity is ***(Ellipse)***

1) $\frac{2}{3}$ 2) $\sqrt{\frac{2}{3}}$ 3) $\sqrt{\frac{3}{2}}$ 4) $\frac{2}{\sqrt{3}}$

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73. The equation to the director circle of the ellipse $\frac{x^2}{25}+\frac{y^2}{16}=1$ is *(Ellipse)*

1) $x^2 + y^2 = 25$ 2) $x^2 + y^2 = 16$ 3) $x^2 + y^2 = 9$ 4) $x^2 + y^2 = 41$

74. If the line $x + y + 1 = 0$ is an asymptote of $x^2 - y^2 + x - y - 2 = 0$, the other asymptote is *(Hyperbola)*

1) $x + y = 0$ 2) $x - y = 0$ 3) $x - y = 1$ 4) $x - y + 1 = 0$

75. $\int \frac{2x+\sin 2x}{1+\cos 2x}dx =$ *(Integration)*

1) $x \tan x + c$ 2) $x \sec x + c$ 3) $x \sec x \tan x + c$ 4) $x (\tan x + \sec x) + c$

76. $\int_0^{\pi/2} \frac{4\sin x+3\cos x}{\sin x+\cos x}dx =$ *(Definite Integrals)*

1) $\frac{5\pi}{4}$ 2) $\frac{3\pi}{2}$ 3) $\frac{7\pi}{4}$ 4) $\frac{5\pi}{6}$

77. $\int_0^{\pi/4} \frac{\sin x+\cos x}{3+\sin 2x}dx =$ *(Definite Integrals)*

1) log 2 2) log 3 3) $\frac{1}{4}$ log 3 4) $\frac{1}{8}$ log 3

78. The area of the region bounded by $|x| + |y| = 1$ is *(Areas)*

1) 1 2) 2 3) $\sqrt{2}$ 4) $2\sqrt{2}$

79. The general solution $\frac{dy}{dx}=\sqrt{1-x^2-y^2+x^2y^2}$ is *(Differentiation Equations)*

1) $\sin^{-1} y = \frac{1}{2}\sin^{-1} x + c$ 2) $\sin^{-1} y = x\sqrt{1-x^2} + \sin^{-1} x + c$

3) $2\sin^{-1} y = x\sqrt{1-x^2} + \sin^{-1} x + c$ 4) $\sin^{-1} y = \sin^{-1} x + c$

80. An integrating factor of $(x + y + 1)\frac{dy}{dx} = 1$ is *(Differentiation Equations)*

1) e^{-x} 2) e^{-y} 3) e^{x} 4) e^{y}

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