MATHS

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

TS EAMCET 2019 (3 MAY SHIFT 2)

Mathematics

1. If [x] denotes the greatest integer $< x$ then the domain of the function function $f(x) = \sqrt{\frac{4-x^2}{[x]+2}}$ is

A. $(-\infty, -2] \cup [-1, 2)$

B. $(-\infty, -2) \cup [-1, 2]$

C. $(-\infty, -2) \cup (-1, 2)$

D. $(-\infty, -1) \cup [-1, 2]$

Answer: B

Watch Video Solution

2. Let $f(x) = (x+1)^2 - 1, x \geq -1$ then

$\{x : f(x) = f^{-1}(x)\}$ =

A. $(0, 1, -1)$

B. $\left\{-1, \frac{-3+i\sqrt{3}}{2}, \frac{-3-i\sqrt{3}}{2}\right\}$

C. $\{0, -1\}$

D. ϕ

Answer: C

Watch Video Solution

3. For all $n \in N$ If $1^2 + 2^2 + 3^2 + \ldots. + n^2 > x$, then x=

A. $\dfrac{n^3}{3}$

B. $\dfrac{n^3}{2}$

C. n^3

D. $\dfrac{n^4}{4}$

Answer: A

Watch Video Solution

4. If the determinant of the matrix

$A = \begin{bmatrix} 0 & a & b \\ -a & 0 & \beta \\ -b & \alpha & 0 \end{bmatrix}$ is zero for all a,b then $\alpha + \beta$=

A. 0

B. 1

C. -1

D. 2

Answer: A

View Text Solution

5. Suppose $n > 1$ and A is a $n \times n$ non singular matrix such that |Adj A| = |Adj (Adj A)|. Then the matrix whose rank is n, is

A. $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 6 & 7 & 8 \end{bmatrix}$

B. $\begin{bmatrix} 2 & 2 & 2 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 2 & 0 & -1 \\ 3 & 4 & 1 & 2 \\ -2 & 3 & 2 & 5 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 4 & -1 \\ 2 & 3 & 0 \\ 0 & 1 & 2 \end{bmatrix}$

Answer: A

Watch Video Solution

6. Consider the following system of equations in matrix form

$$\begin{pmatrix} 1 \\ 2 \\ \lambda \end{pmatrix}(1, 2, \lambda)\begin{pmatrix} x \\ y \\ z \end{pmatrix} = 0$$

Then which one of the following statements is true ?

A. $\forall\lambda \in (-\infty, \infty)$, the given system has non trivial solution

B. $\forall\lambda \in (-\infty, \infty)$, the given system has only trivial solution

C. For $\lambda \neq 0$ the given system does not have any solution

D. For $\lambda = 0$ the given system is inconsistent

Answer: A

Watch Video Solution

7. If the amplitude of $(z - 1 - 2i)\text{is}\frac{\pi}{3}$, then the locus of z is

A. $y = \sqrt{3x} + (2 - \sqrt{3})$

B. $y = \sqrt{3x} - \sqrt{3}$

C. $x = \sqrt{3y} + (2 - \sqrt{3})$

D. $y = \sqrt{3x} + 2$

Answer: A

Watch Video Solution

8. If the point $\left(\frac{k-1}{k}, \frac{k-2}{k}\right)$ lies on the locus of z satisfying the inequality $\left|\frac{z+3i}{3z+i}\right| < 1$, then the interval in which k lies is

A. $(-\infty, 2) \cup (3, \infty)$

B. $[2, 3]$

C. $[1, 5]$

D. $(-\infty, 1) \cup (5, \infty)$

Answer: D

Watch Video Solution

9. If the comples cube roots of (-i) are α, β, γ the $\alpha^2 + \beta^2 + \gamma^2$=

A. 1

B. -1

C. $-i$

D. 0

Answer: D

Watch Video Solution

10. Imaginary part of $(\sqrt{3}-i)^{2016} + (-\sqrt{3}-i)^{2019}$ is

A. 2^{2016}

B. -2^{2016}

C. -2^{2019}

D. 2^{2019}

Answer: C

Watch Video Solution

11. If α and β are the roots of the equation $x^2 - 2x + 4 = 0$, then $\alpha^{12} + \beta^{12}$=

A. 2^{12}

B. 2^{10}

C. 2^{13}

D. -2^{13}

Answer: C

View Text Solution

12. The solution set of the inequation

$3^x + 3^{1-x} - 4 < 0$, is

A. $(0, 1)$

B. $(0, 2)$

C. $(1, 2)$

D. $(1, 3)$

Answer: A

Watch Video Solution

13. One of the real roots of the equation

$x^3 - 6x^2 + 6x - 2 = 0$ is

A. -1

B. 2

C. $\dfrac{2^{\frac{1}{3}}}{2^{\frac{1}{3}} - 1}$

D. $\dfrac{2^{\frac{1}{3}}}{2^{\frac{1}{3}} + 1}$

Answer: C

Watch Video Solution

14. Assume that α, β, γ are the roots of

$2x^3 + 5x^2 + 5x + 2 = 0 \text{for} \quad h \in R,$ if

$\alpha + h, \beta + h, \gamma + h$ are roots of

$a(h)x^3 + b(h)x^2 + c(h)x + d(h) = 0$ then

A. $c(h) \neq 0, \ \forall h \in R$

B. $b\left(-\frac{5}{6}\right) = 0$

C. $c(-2) = 0$

D. d (h) vanishes for these distinct real values of h

Answer: A

Watch Video Solution

15. The number of non- constant functions f

From X= {0,1,2} to Y = {1,2,3,4,5,6,7,8} such that $f(i) < \text{f(j)}, i \in X \text{ and } I < j$ is

A. 120

B. 92

C. 56

D. 112

Answer: D

View Text Solution

16. The number of values of $n \in N$ for which

${}^{n+2}C_2 : {}^{n+3}C_1 = 4:2$ is

A. 0

B. 1

C. 2

D. 3

Answer: A

Watch Video Solution

17. Consideer the following statements :

I . Number of ways of placing 'n' objects in k bins

$(k \leq n)$ such that no bin is empty is ${}^{n-1}C_{k-1}$.

II. Number of ways of writing a positive integer 'n' into a sum of k positive integers is ${}^{n-1}C_{k-1}$.

III. Number of ways of placing 'n' objects in k bins such that atleast one bin is non- empty is ${}^{n-1}C_{k-1}$.

IV. ${}^{n}C_{k} - {}^{n-1}C_{k} = {}^{n-1}C_{k-1}$

then which of the above statements are true ?

A. All the four statements

B. III and IV only

C. All except III

D. All except I

Answer: C

View Text Solution

18. For $|x| < \frac{4}{3}$, the approximate value of

$\frac{1}{(4-3x)^{\frac{1}{2}}}$ is

A. $\frac{1}{4} - \frac{2x}{3} + \frac{12x^2}{39}$

B. $1 - \frac{3x}{16} - \frac{15}{256}x^2$

C. $\frac{1}{2} + \frac{3x}{16} + \frac{27x^2}{256}$

D. $\frac{1}{2} - \frac{3x}{16} + \frac{15}{256}x^2$

Answer: C

Watch Video Solution

19. If $\frac{2x+7}{(x^2+4)(x^2+9)(x^2+16)}$

$= \frac{Ax+l}{x^2+4} + \frac{Bx+m}{x^2+9} + \frac{Cx+n}{x^2+16}$, then

$$\frac{1}{A}+\frac{1}{B}+\frac{1}{C}=$$

A. 0

B. 27

C. $\frac{105}{2}$

D. $\frac{109}{2}$

Answer: D

Watch Video Solution

20. Maximum value of

$\left(2\cos^2 18^\circ - \sin 18^\circ\right)\left(\cos\theta + 3\sqrt{2}\cos\left(\theta+\frac{\pi}{4}\right)+3\right)$ is

A. $5\sqrt{2}$

B. $4\sqrt{5}$

C. 3

D. 8

Answer: D

Watch Video Solution

21. If $0 < A < B < \frac{\pi}{4}, \cos(A+B) = \frac{11}{61} \text{ and } \sin(A-B) = \frac{24}{25} \text{then} \sin 2A +$

A. $\frac{684}{1525}$

B. $\frac{156}{1525}$

C. $\frac{168}{305}$

D. $\frac{137}{305}$

Answer: C

Watch Video Solution

22. If $A+B+C=270^{\circ}$, then cos 2A + cos 2B +cos 2C +4sin A sin B sin

C=

A. 3

B. 2

C. 1

D. -1

Answer: C

Watch Video Solution

23. The general solution of $\cos 2x - 2\tan x + 2 = 0$ is

A. $(2n+1)\frac{\pi}{3}, n \in Z$

B. $(n+1)\frac{\pi}{3}, n \in Z$

C. $n\pi + \frac{\pi}{3}, n \in Z$

D. $n\pi + \frac{\pi}{4}, n \in Z$

Answer: D

View Text Solution

24. If α and β are the roots of the quadratic equation $3x^2 - 16x + 5 = 0$ then $\tan^{-1}\alpha + \tan^{-1}\beta - \tan^{-1}\left(\frac{\alpha+\beta}{1-\alpha\beta}\right) =$

A. 0

B. π

C. $\frac{\pi}{2}$

D. $-\pi$

Answer: B

View Text Solution

25. $\sinh\left[\log\left(2+\sqrt{5}\right)\right] + \cosh\left[\log\left(2+\sqrt{3}\right)\right] =$

A. 4

B. 3

C. 2

D. 1

Answer: A

Watch Video Solution

26. p_1, p_2, p_3 are the altitudes of a triangle ABC drawn from the vertices A,B and C respictively . If Δ is the area of the triangle and 2s is the sum of its sides, a,b and c then

$$\frac{1}{p_1}+\frac{1}{p_2}-\frac{1}{p_3}=$$

A. $\frac{s-a}{\Delta}$

B. $\frac{s-b}{\Delta}$

C. $\frac{s-c}{\Delta}$

D. $\frac{s}{\Delta}$

Answer: D

Watch Video Solution

27. If in triangle ABC, $a^2 + 2bc - (b^2 + c^2) = ab\sin\left(\frac{C}{2}\right)\cos\left(\frac{C}{2}\right)$,

then cot (B+C) =

A. $-\frac{8}{15}$

B. $\frac{1}{4}$

C. $-\frac{15}{8}$

D. 4

Answer: C

Watch Video Solution

28. If p_1, p_2, p_3 are the altitudes of a triangle ABC from the vertices A,B,C respectively , then with the usual notation, $\frac{1}{r_1^2} + \frac{1}{r_2^2} + \frac{1}{r_3^2} + \frac{1}{r^2} =$

A. $p_1p_2p_3$

B. $\frac{a^2b^2c^2}{4\Delta^2}$

C. $\frac{a^2b^2c^2}{\Delta^2}$

D. $4\left(\frac{1}{p_1^2}+\frac{1}{p_2^2}+\frac{1}{p_3^2}\right)$

Answer: D

Watch Video Solution

29. Vectors a,b,c,d are such that $(a \times b) \times (c \times d) = O, P_1$ and P_2 are two planes determined by vectors a,b and c,d respectively . Then the angle between the planes P_1 and P_2 is

A. 0

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{2}$

Answer: A

Watch Video Solution

30. If $OA = \hat{i} + 2\hat{j} + 3\hat{k}$ and $OB = 4\hat{i} + \hat{k}$ are the position vectors of the points A and B then , the position vector of a point on the line passing through B and parallel to the vector $OA \times OB$ which is at a distance of $\sqrt{189}$ units from B is

A. $6\hat{i} + 11\hat{j} - 7\hat{k}$

B. $4\hat{i} + 11\hat{j} - 8\hat{k}$

C. $2\hat{i} - 11\hat{j} + 8\hat{k}$

D. $-2\hat{i} - 11\hat{j} + 8\hat{k}$

Answer: A

Watch Video Solution

31. A vector a of length 2 units is making an angle 60° with each of the x - axis and y - axis . If another vector B of length $\sqrt{2}$ units is making an angle 45° with each of the y- axis and Z - axis then $a \times b =$

A. $(1 - \sqrt{2})\hat{i} - \hat{j} + \hat{k}$

B. $\hat{i} - \sqrt{2}\hat{j} + \hat{k}$

C. $\sqrt{2}\hat{i} - \hat{j} + 2\hat{k}$

D. $I - 2\hat{j} + (1 - \sqrt{2})\hat{k}$

Answer: A

Watch Video Solution

32. Let a be a non zero vector . If

$X = \hat{i} \times \left(a \times \hat{i}\right), y = \hat{j} \times \left(a \times \hat{j}\right)$ and $Z = \hat{k} \times \left(a \times \hat{k}\right)$ then [x y z]

=

A. |a|

B. 2 |a|

C. 0

D. 1 |a|

Answer: C

Watch Video Solution

33. If

$r = \hat{i} + \hat{j} + t\left(2\hat{i} - \hat{j} + \hat{k}\right)$ and $r = 2\hat{i} + \hat{j} - \hat{k} + s\left(3\hat{i} - 5\hat{j} + 2\hat{k}\right)$ are the vector equations of two lines L_1 and L_2 then the shortest distance between them is

A. $\frac{9}{\sqrt{59}}$

B. $\frac{10}{\sqrt{59}}$

C. $\frac{11}{\sqrt{59}}$

D. 0

Answer: B

Watch Video Solution

34. If r is a unit vector satisfying $r \times a = b$, $|a| = 2$ and $|b| = \sqrt{3}$, the one such r =

A. $\frac{1}{4}[(2a + (b \times a)]$

B. $\frac{1}{4}[a - (2b \times a)]$

C. $\frac{1}{3}[a - (b \times a)]$

D. $\frac{1}{4}[a - (b \times a)]$

Answer: D

Watch Video Solution

35. The variance of the data 2,3,5,11,13,17,19 is nearly

A. 6.258

B. 24.25

C. 4.95

D. 39.71

Answer: D

View Text Solution

36. The approximate value of the mean deviation about the mean for the following data is

Class interval	$0-2$	$2-4$	$4-6$	$6-8$	$8-10$
Frequency	1	2	3	2	1

A. 3.56

B. 4.61

C. 2.19

D. 1.78

Answer: D

View Text Solution

37. If A and B are two events such that

$$P(\overline{A}) = 0.3P(B) = 0.4 \text{ and } P(A \cap \overline{B}) = 0.5 \text{then} P\left(\frac{B}{A} \cup \overline{B}\right) =$$

A. 0.3

B. 0.1

C. 0.25

D. 0.75

Answer: C

View Text Solution

38. Bag I contains 3 red and 4 black balls. Bag II contains 5 red and 6 black balls. If one ball is drawn at random from one of the bags and it is found to be red, then the probability that it was drawn from Bag II, is

A. $\frac{33}{68}$

B. $\frac{35}{68}$

C. $\frac{37}{68}$

D. $\frac{41}{68}$

Answer: B

Watch Video Solution

39. Two dice A and B are rolled. If it is known that the number on B is 5, then the probability that the sum of the numbers on the two dice will be greater than 9 is

A. $\frac{1}{3}$

B. $\frac{1}{4}$

C. $\frac{1}{5}$

D. $\frac{1}{2}$

Answer: A

View Text Solution

40. As a business strategy , 20% of the new internet service subscribers selected randomly receive a special promotion. If a group of 5 such subscribers signs for the service, then the probability that at least two of them get the special promotion is

A. $\frac{819}{3125}$

B. $\frac{821}{3125}$

C. $\frac{823}{3125}$

D. $\frac{817}{3125}$

Answer: B

Watch Video Solution

41. In a communication network , network , ninety eight percent of messages are transmitted with no error. If a random variable X denotes the numbers of incorrectly transmitted messages, then the probability that atmost one message is transmitted incorrectly out of 500 messages sent is

A. $\frac{11}{e^{10}}$

B. $\dfrac{e^{10}-1}{e^{10}}$

C. $\dfrac{10}{e^{10}}$

D. $\dfrac{98}{e^{10}}$

Answer: A

Watch Video Solution

42. The locus of all points that are at a distance of atleast 2 units from (-3,0) is

A. $\{(x, y) \mid x^2 + y^2 + 6x + 7 > 0\}$

B. $\{(x, y) \mid x^2 + y^2 + 6x + 5 \geq 0\}$

C. $\{(x + y) \mid x^2 + y^2 - 6x + 5 > 0\}$

D. $\{(x, y) \mid x^2 + y^2 - 6x + 5 \leq 0\}$

Answer: B

Watch Video Solution

43. If $\theta_1, \theta_2, \theta_3$ are respectively the angles by which the coordinate axes are to be rotated to eliminate the xy term from the following equations, then the descending order of these angles is

$A_1 = 3x^2 + 5xy + 3y^2 + 2x + 3y + 4 = 0$

$A_2 = 5x^2 + 2\sqrt{3}xy + 3y^2 + 6 = 0$

$A_3 = 4x^2 + \sqrt{3}xy + 5y^2 - 4 = 0$

A. $\theta_1, \theta_2, \theta_3$

B. $\theta_3, \theta_1, \theta_2$

C. $\theta_2, \theta_1, \theta_3$

D. $\theta_3, \theta_2, \theta_1$

Answer: B

Watch Video Solution

44. If $x\cos\alpha + y\sin\alpha = p$ is the normal form of the equation of a straingent line $x + \sqrt{3}y + 4 = 0$ and a,b are respectively x,y - intercepts of this line, then $\sqrt{3}\pi bp - 3a\alpha =$

A. 0

B. 1

C. $\frac{\pi}{2}$

D. 8π

Answer: D

Watch Video Solution

45. The distance between the circumcentre and the centroid of the triangle formed by the vertices (1,2) , (3,-1) and (4,0) is

A. $-\frac{1}{\sqrt{2}}\sqrt{45}$

B. 4

C. $\frac{7\sqrt{2}}{15}$

D. $\frac{9\sqrt{2}}{5}$

Answer:

Watch Video Solution

46. If a straight line passes through the point (-5,4) and makes an intercept of length $\frac{2}{\sqrt{5}}$ between the lines x+2y+1=0 and x+2y -1 =0 , then equation of that line is

A. 5x+6y+1=0

B. 2x+3y-2 =0

C. 3x+4y-1 =0

D. 2x-y +14 =0

Answer: D

Watch Video Solution

47. If θ is the angle between the lines joining the origin to the points of intersection of the curve $2x^2 + 3y^2 = 6$ and the line x+y =1, then $\sin\theta$=

A. 1

B. $\frac{\sqrt{7}}{145}$

C. $\sqrt{\frac{96}{145}}$

D. $\frac{1}{2}$

Answer: C

Watch Video Solution

48. The ratio in which the line x+y -1 =0 divides the line segment joining the origin and the point of intersection of the lines represented by $2x^2 - 13xy - 7y^2 + x + 23y - 6 = 0$ is

A. $15 : 11$

B. $-11:15$

C. $7:3$

D. $7:19$

Answer: A

Watch Video Solution

49. The lines represented by $5x^2 - xy - 5x + y = 0$ are normals to a circle S=0. If this circle touches the circle $S' \equiv x^2 + y^2 - 2x + 2y - 7 = 0$ externally, then the equation of the chord of contact of centre of $s' = 0$ with respect to S=0 is

A. 2y-7 =0

B. x-1 =0

C. 3x+4y -7 =0

D. x+y =5

Answer: A

View Text Solution

50. The equation of the circle that touches the y -axis at a distance of 4 units from the origin and cuts off an intercept of 6 units on the x -axis is

A. $X^2 + y^2 \pm 5x - 8y + 16 = 0$

B. $X^2 + y^2 \pm 2x - 4y = 0$

C. $x^2 + y^2 \pm 3x - 2y - 8 = 0$

D. $x^2 + y^2 \pm 10x - 8y + 16 = 0$

Answer: D

View Text Solution

51. The condition for the circles

$x^2 + y^2 + ax + 4 = 0$ and $x^2 + y^2 + by + 4 = 0$ to touch each other is

A. $\frac{1}{a^2} - \frac{1}{b^2} = \frac{1}{16}$

B. $a^2 + b^2 = 16$

C. $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{16}$

D. $\frac{1}{a^2} + \frac{1}{b^2} = 4$

Answer: C

View Text Solution

52. If the equation of the circle which passes through the point (1,1) and cuts both the circles $x^2 + y^2 - 4x - 6y + 4 = 0$ and $x^2 + y^2 + 6x - 4y + 15 = 0$ orthogonally is $x^2 + y^2 + 2gx + 2fy + c = 0$ then 5g +2f +c =

A. 0

B. 1

C. 3

D. 2

Answer: D

Watch Video Solution

53. If the line x+y +1=0 intersects the circle $x^2+y^2+x+3y=0$ at two points A and B , then the centre of the circle which passes through the points A,B and the point of intersection of the tangents drawn at A and B to the given circle is

A. $\left(\frac{5}{8}, \frac{5}{8}\right)$

B. $(1, \ -1)$

C. $\left(\frac{3}{4}, \ -\frac{1}{4}\right)$

D. $(3, \ -4)$

Answer: C

View Text Solution

54. The vertex of the parabola $(y-1)^2 = 8(x-1)$ is at the centre of a circle and the parabola cuts that circle at the ends of its latusrectum. Then the equation of that circle is

A. $x^2 + y^2 - 2x - 2y - 18 = 0$

B. $x^2 + y^2 - 2x - 2y + 18 = 0$

C. $x^2 + y^2 + 2x + 2y - 16 = 0$

D. $x^2 + y^2 - 2x - 2y + 16 = 0$

Answer: A

Watch Video Solution

55. Consider the curves $C_1 : y^2$ and $C_2 : x^2 + y^2 - 6x + 1 = 0$

Assertion (A) The common tangents to the curves C_1 and C_2 are othogonal.

Reason (R) x-y+1=0 and x+y+1=0 are the common tangents to the curves C_1 and C_2 The correct answer is

A. (A) is true, (R) is true and (R) is the correct explanation of (A)

B. (A) is true , (R) is true but (R) is not a correct explanation of (A)

C. (A) is true but (R) is false

D. (A) is false but (R) is true.

Answer: A

View Text Solution

56. If OT is the semi- minor axis of an ellipse A and B are its foci and $\angle ATB$ is right angle , then the eccentricity of that ellipse is

A. 1

B. $\frac{1}{\sqrt{3}}$

C. $\frac{1}{\sqrt{2}}$

D. $\frac{1}{2}$

Answer: C

Watch Video Solution

57. The locus of the mid - points of the portion of the tangents of the ellipse $\frac{x^2}{2}+\frac{y^2}{1}=1$ intercepted between the coordinate axes is

A. $\frac{1}{4x^2}+\frac{1}{2y^2}=1$

B. $2x^2+y^2=4$

C. $\frac{1}{2x^2}+\frac{1}{4y^2}=1$

D. $x^2+2y^2=4$

Answer: C

Watch Video Solution

58. The distance between the tangents to the hyperbola $\frac{x^2}{20}-\frac{3y^2}{4}=1$ which are parallel to the line x+3y =7 is

A. $4\sqrt{5}$

B. $\frac{4}{\sqrt{5}}$

C. $\frac{2}{\sqrt{5}}$

D. $2\sqrt{5}$

Answer: B

Watch Video Solution

59. The length of the projection of the line segment joining the points (3,4,5) and (4,6,3) on the line joining the points (-1,2,4) and (1,0,5) is

A. $\frac{4}{3}$

B. $\frac{5}{4}$

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

D. 1

Answer: A

View Text Solution

60. If A(3,2,3), B (1,4,6) and C (7,4,5) are the three vertices of a parallelogram ABCD, then the angle between its diagonal through D and the side DC is

A. $\cos^{-1}\left(\frac{16}{\sqrt{357}}\right)$

B. $\cos^{-1}\left(\frac{5}{\sqrt{126}}\right)$

C. $\cos^{-1}\left(\frac{5}{\sqrt{21}}\right)$

D. $\cos^{-1}\left(\frac{2}{\sqrt{357}}\right)$

Answer: A

Watch Video Solution

61. π_1 is a plane passing through the point (1,2,3) and perpendicular to the planes x+2y+3z -6 =0, x+2y+2z -5 =0 .

if (-1,2,-3) is the foot of the perpendicular drawn from the point (1,3,2) on to a plane π_2 ,then the angle between the planes π_1 and π_2 is

A. $\cos^{-1}\left(\frac{9}{\sqrt{255}}\right)$

B. $\frac{\pi}{4}$

C. $\cos^{-1}\left(\frac{\sqrt{6}}{10}\right)$

D. $\frac{\pi}{2}$

Answer: C

Watch Video Solution

62. If [x] is the greatest integer function, then

$$\lim_{x \to 2^+}\left(\frac{[x]^3}{3} - \left[\frac{x}{3}\right]^3\right) =$$

A. 0

B. $\frac{64}{27}$

C. $\frac{8}{3}$

D. $\frac{7}{3}$

Answer: C

Watch Video Solution

63. If the function defined by

$$f(x)=\begin{cases}\left(x^2+e^{\frac{1}{2-x}}\right)^{-1} & \text{For} \quad x\neq 2\\ k & \text{For} \quad x=2\end{cases}$$

is right continuous at x=2 then k=

A. $-\frac{1}{4}$

B. 0

C. $\frac{1}{4}$

D. 1

Answer: C

View Text Solution

64. If $\begin{cases} ax+b & \text{if } x \leq 1 \\ ax^2+c & \text{if } 1 < x \leq 2 \\ \frac{dx^2+1}{x} & \text{if } x \geq 2 \end{cases}$

Is differentiable on R, then ad- bc =

A. 0

B. 1

C. -1

D. 2

Answer: C

View Text Solution

65. Suppose $f(x) = e^{-\sqrt{x}} + e^{-\frac{1}{x^2}}$. If

$$f'' = \alpha \frac{e^{-\sqrt{x}}}{x}\left(1 + \frac{1}{\sqrt{x}}\right) + \beta \frac{e^{-\frac{I}{x^2}}}{x^4}\left(3 - \frac{2}{x^2}\right)$$

Then (α, β) =

A. $\left(\frac{1}{4}, 2\right)$

B. $\left(\frac{1}{4}, -2\right)$

C. $\left(-\frac{1}{4}, 2\right)$

D. $\left(-\frac{1}{4}, -2\right)$

Answer: B

Watch Video Solution

66. The derivative of $\cos h^{-1}$ x with respect to log x at x=5 is

A. $\frac{5}{\sqrt{26}}$

B. $\frac{1}{\sqrt{26}}$

C. $\frac{1}{2\sqrt{6}}$

D. $\frac{5}{2\sqrt{6}}$

Answer: D

Watch Video Solution

67. A right solid circular cylinder of given volume will have the least total surface area when

A. its height is equal to its radius

B. its height is equal to its diameter

C. its height is independent of its radius

D. its height is $\frac{3}{4}$ times of its radius

Answer: B

Watch Video Solution

68. The smaller side of the rectangle with the largest area, that can be inscribed inside a semi- circle of radius 2 units is of length

A. $\frac{1}{\sqrt{2}}$

B. $\sqrt{3}$

C. $\frac{1}{\sqrt{3}}$

D. $\sqrt{2}$

Answer: D

View Text Solution

69. Let a,b,c $\in R$ be such that 2a +3b +6c =0 and g(x) be the anti derivative of

$f(x) = ax^2 + bx + c$. If the slopes of the tangents drawn to the curve y= g(x) at (1,g(l)) and (2,g(2)) are equal, then

A. $\frac{a}{3} = \frac{b}{-8} = \frac{c}{3}$

B. $\frac{a}{6} = \frac{b}{-18} = \frac{c}{7}$

C. $\frac{a}{3} = \frac{b}{-6} = \frac{c}{2}$

D. $a = b = c = -1$

Answer: B

Watch Video Solution

70. Let $f(x) = (x-3)^{2018}(2-x)^{2019}, x \in R$. If (α) is a relative maximum of f at α, then $2\alpha_3 f(\alpha) =$

A. $\frac{20186}{4037}$

B. $\frac{20186}{4037} - 3\left(\frac{2018}{4037}\right)^{2018}\left(\frac{2019}{4037}\right)^{2019}$

C. 6

D. 9

Answer: C

View Text Solution

71. $\int \sin^{-1}\sqrt{-\frac{x}{a+x}}dx =$

A. $\cos ec^{-1}\left(\sqrt{\frac{x}{a+x}}\right)\left(\frac{x}{a}\right) + ax + c$

B. $\cos^{-1}\left(\sqrt{\frac{x}{a}}\right)(a-x)^2 - \sqrt{ax} + c$

C. $\cos^{-1}\left(\sqrt{\frac{x}{a}}\right)(a+x) - \sqrt{ax} + c$

D. $\tan^{-1}\left(\sqrt{\frac{x}{a}}\right)(a+x)-\sqrt{ax}+c$

Answer: D

View Text Solution

72. $\int\frac{x^2-1}{x^3\sqrt{2x^4-2x^2+1}}dx=$

A. $\sqrt{2x^2+2+\frac{3}{x^2}+c}$

B. $\sqrt{2x^2-\frac{1}{x^2}+2+c}$

C. $\sqrt{2x^2+x-2+c}$

D. $\frac{1}{2}\sqrt{2-\frac{2}{x^2}+\frac{1}{x^4}+c}$

Answer: D

Watch Video Solution

73. $\int(\log(\sin x)+x\cot x)dx=$

A. $x \log(\sin x) + c$

B. $x^2 \log(\sin x) + c$

C. $-x \log(\sin x) + c$

D. $-x^2 \log(\sin x) + c$

Answer: A

Watch Video Solution

74. If $\int \frac{2x^2}{(2x^2 + \alpha)(x^2 + 5)} dx$
$= \frac{\sqrt{5}}{3} \tan^{-1} \frac{x}{\sqrt{2}} + c, then \alpha =$

A. 1

B. 2

C. 3

D. 4

Answer: D

View Text Solution

75. If $\int_0^3 (3x^2 - 4x + 2)dx = k$ then a root of $3x^2 - 4x + 2 = \frac{3k}{5}$ that lies in the interval [0,3] is

A. $\frac{2}{3}$

B. $\frac{7}{3}$

C. $\frac{1}{2}$

D. $\frac{5}{2}$

Answer: B

Watch Video Solution

76. If $\int_0^{2a} x^2\sqrt{2ax - x^2}dx = ka^4$ then $k:\pi$=

A. $1:8$

B. $3:8$

C. $5:8$

D. $9:8$

Answer: C

Watch Video Solution

77. The area of the region (in square units) bounded by the curves $y=x^3, y=x$ and $-1 \leq x \leq 1$ is

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

B. $\frac{1}{2}$

C. $\frac{3}{4}$

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

Answer: B

View Text Solution

78. If the order of a differential equation

$$\frac{d^2y}{dx^2} - 2\left(\frac{dy}{dx}\right)^3 + \sin\left(\frac{dy}{dx}\right) + y = 0$$ is l and the degree of the differential equation

$$\left(1 + \frac{d^2y}{dx^2}\right)^{\frac{2}{3}} = \left[2 - \left(\frac{dy}{dx}\right)^3\right]^{\frac{3}{2}}$$ is m, then the differential equation corresponding to the family of curves

$y = Ax^l + Be^{mx}$, where A and B are arbitrary constants is

A. $(4x^2 - 2x)y'' + (16x^2 - 2)y' + (32x = 8)y = 0$

B. $(2x^2 - x)y'' + (8x^2 - 2)y' + (16x - 4)y = 0$

C. $(2x^2 - 4t)y'' - (8x^2 - 1)y' + (16x - 4)y = 0$

D. $(4x^2 - 2x)y'' + (8x^2 - 1)y' + (16x - 4)y = 0$

Answer: C

View Text Solution

79. The solution of the differential equation

$ydx - xdy + 3x^2y^2e^{x^3}dx = 0$ satisfying y=1 when x=1 , is

A. $y\left(e^{x3}-(1+2e)\right)-x=0$

B. $y\left(e^{x3}+(1-e)\right)+x=0$

C. $y\left(e^{x3}+(1+e)\right)-x=0$

D. $y\left(e^{x3}-(1+e)\right)+x=0$

Answer: D

Watch Video Solution

80. The solution of the differential equation $\left(1+y^2\right)+\left(x-e^{\tan^{-1}y}\right)\frac{dy}{dx}=0$ is

A. $xe^{2\tan^{-1}y}-e^{\tan^{-1}y}=c$

B. $(x-2)e^{\tan^{-1}y}=c$

C. $2xe^{\tan^{-1}y}-e^{2\tan^{-1}y}=c$

D. $xe^{\tan^{-1}y}+2e^{2\tan^{-1}y}=c$

Answer: C

Watch Video Solution