MATHS

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

TS EAMCET 2018 (7 MAY SHIFT 1)

Mathematics

1. If $f:[0, \infty) \rightarrow [0, \infty)$ is defined by $f(x) = \dfrac{x}{1+x}$, then f is

A. neither one-one not onto

B. one-one but nor onto

C. onto but not one-one

D. both one-one and onto

Answer: B

Watch Video Solution

2. The range of the function $f(x) = -\sqrt{-x^2 - 6x - 5}$ is

A. $[-2, 0]$

B. $[0, 2]$

C. $(-\infty, -2]$

D. $[-2, 2]$

Answer: A

View Text Solution

3. If $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then for all $n \in N$

A. $A^n = nA$

B. $A^n = nA + (n-1)l$

C. $A^n = (n-1)A - nl$

D. $A^n = nA - (n-1)l$

Answer: D

Watch Video Solution

4. The rank of the matrix $\begin{bmatrix} 3 & 2 & 1 & -4 \\ 2 & 3 & 0 & -1 \\ 1 & -6 & 3 & -8 \end{bmatrix}$ is

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

5. Let A,B,C be 3×3 non-sinigular matrices and I be the identity matrix of order three. If $ABA = BA^2B$ and $A^3 = I$, then $AB^4 - B^4A =$

A. $O_{3 \times 3}$

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

C. l

D. 2l

Answer: A

Watch Video Solution

6. If the system of equation

$x + y + 2z = 3, x + 2y + 3z = 4$ and $x + cy + 2xz = 5$ is inconsistent, then

A. $c = 1$

B. $c = 3$

C. $c \in R$

D. $c \neq 1$

Answer: A

Watch Video Solution

7. If $z = x + iy$ is complex number satisfying $\left|\frac{z - 2i}{z + 2i}\right| = 2$ and the locus of z is a circle, then its radius is

A. A. $\frac{5}{3}$

B. B. $\sqrt{\frac{71}{9}}$

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

D. 4. $\frac{1}{3}$

Answer: C

Watch Video Solution

8. If $(x - iy)^{\frac{1}{3}} = a + ib,$ then $\dfrac{ax - by}{a - b} =$

A. $a^3 - b^3$

B. $a^3 + a^2b + ab^2 + b^3$

C. $a^3 + 3a^2b + 3ab^2 + b^2$

D. $a^4 - b^4$

Answer: B

Watch Video Solution

9. If $z = x$ is is a complex number and $|1 + iz| = |1 - iz|,$ then

A. $Re(z) > 0$

B. $|z| = 1$

C. $z = \overrightarrow{z}$

D. $z = -\overrightarrow{z}$

Answer: C

Watch Video Solution

10. The sum of the least positive arguments of the distinct cube roots of the complex number `(1-i sqrt3) is

A. $\frac{5\pi}{3}$

B. $\frac{17\pi}{3}$

C. $\frac{23\pi}{3}$

D. $\frac{11\pi}{3}$

Answer: D

View Text Solution

11. Let R-(α, β), be the range of $\frac{x+3}{(x-1)(x+2)}$. Then the sum of the intercepts of the line $\alpha x + \beta y + 1 = 0$ on the coordinate axis is

A. -8

B. 10

C. 8

D. -10

Answer: B

View Text Solution

12. If $\alpha, \beta$are the roots of the equation $x^2+5x+2=0$, then $\left(\frac{\alpha}{2+5\alpha}\right)^2+\left(\frac{\beta}{2+5\beta}\right)^2=$

A. $\frac{4}{21}$

B. $\frac{19}{4}$

C. $\frac{21}{4}$

D. $\frac{4}{19}$

Answer: C

Watch Video Solution

13. If the roots of

$x^4 - 10x^3 + 37x^2 - 60x + 36 = 0$ are $\alpha, \alpha, \beta, \beta(\alpha < \beta)$, then $2\alpha + 3\beta - 2\alpha\beta =$

A. 1

B. 0

C. -1

D. 4

Answer: A

Watch Video Solution

14. The polynomial equation of degree 5 whose roots are the translates of the roots of $x^5 - 2x^4 + 3x^3 - 4x^2 + 5x - 6 = 0 by - 2$ is

A. $x^5+8x^4+27x^3+46x^2+41x+12=0$

B. $x^5+8x^4+27x^3+46x^2+41x+12=0$

C. $x^5+6x^4+28x^2+46x^2+41x+12=0$

D. $x^5+8x^4+28x^3+46x^2+41x+12=0$

Answer: B

Watch Video Solution

15. The number of natural numbers less than 1000, in which no two digits are repeated is

A. 729

B. 738

C. 792

D. 836

Answer: B

Watch Video Solution

16. The coefficient of x^3 in the expansion of $\frac{1-2x}{(2x+1)(2-x)}$ is

A. $-\frac{509}{80}$

B. $\frac{509}{80}$

C. $-\frac{103}{16}$

D. $\frac{103}{16}$

Answer: C

Watch Video Solution

17. If the coefficient of rth, (r + 1)th and (r+ 2)th terms in the expansion of $(1+x)^n$ are respectively in the ratio $2:4:5$, then (r,n)=

A. $(2, 7)$

B. $(3, 8)$

C. $(3, 9)$

D. $(4, 9)$

Answer: B

Watch Video Solution

18. If n is positive integer greater than 1, then $3(^nC_0) - 8(^nC_1) + 13(^nC_2) + \ldots$ upto $(n+1)$ terms =

A. -5

B. $\dfrac{2^{n-1} - 1}{n}$

C. $\dfrac{2^{n-1}}{2}$

D. 0

Answer: D

Watch Video Solution

19. $\frac{3x-2}{(x+1)^2(x+2)} = \frac{A}{x+1} + \frac{B}{(x+1)^2} + \frac{C}{x+3}$, then $A+B+C$ =

A. $\frac{11}{4}$

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

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

D. $-\frac{11}{4}$

Answer: C

Watch Video Solution

20. If

$\sin\theta + \sin^2\theta = 1$ and $\cos^{12}\theta + a\cos^{10}\theta + b\cos^8\theta + c\cos^6\theta + d = 0$,

then

A. $ab = cd$

B. $ac = bd$

C. $ab + cd = 0$

D. $ac + bd = 0$

Answer: D

Watch Video Solution

21. $\cos 20^\circ \cdot \cos 40^\circ \cdot \cos 60^\circ \cdot \cos 80^\circ =$

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

B. $\frac{1}{8}$

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

D. $\frac{1}{16}$

Answer: D

Watch Video Solution

22. $If A + B + C = \frac{\pi}{4}$ then

$4\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2} - \cos\frac{\pi}{8} =$

A. $\cos\left(\frac{\pi}{4} - A\right) + \cos\left(\frac{\pi}{4} - B\right) + \cos\left(\frac{\pi}{4} - C\right)$

B. $\cos\left(\frac{\pi}{8} - A\right) + \cos\left(\frac{\pi}{8} - B\right) + \cos\left(\frac{\pi}{8} - C\right)$

C. $\sin\left(\frac{\pi}{4} - A\right) + \cos\left(\frac{\pi}{4} - B\right) + \cos\left(\frac{\pi}{4} - C\right)$

D. $\sin\left(\frac{\pi}{8} - A\right) + \cos\left(\frac{\pi}{8} - B\right) + \cos\left(\frac{\pi}{8} - C\right)$

Answer: B

View Text Solution

23. Let

$A = \left\{x \in , R / \left|\sqrt{3}\cos x - \sin x\right| \geq 2, 0 \leq x \leq 2\pi\right\}. If x_1 \in A, x_2 \in A,$

then $\frac{x_1}{x_2} =$

A. $\frac{5}{23}$

B. $\frac{11}{17}$

C. $\frac{5}{11}$

D. $\frac{11}{23}$

Answer: C

Watch Video Solution

24. All the values of x satisfying the equation $2\tan^{-1}2x = \sin^{-1}\left(\frac{4x}{1+4x^2}\right)$ lie in the interval

A. $\left[-\frac{1}{2}, \frac{1}{2}\right]$

B. $[-1, 1]$

C. $\left[\frac{1}{2}, \infty\right)$

D. $\left[-\infty, -\frac{1}{2}\right)$

Answer: A

Watch Video Solution

25. $\sin h^{-1} 2 + \cos h^{-1} 2 - \tanh^{-1} \frac{2}{3} + \cot h^{-1}(2) =$

A. $\log\left(\frac{4 + 2\sqrt{3} + 2\sqrt{5} + \sqrt{15}}{\sqrt{15}}\right)$

B. $\left(\frac{4 + \sqrt{3} + \sqrt{5} + \sqrt{15}}{\sqrt{15}}\right)$

C. $\left(\frac{\left(2 + \sqrt{3}\right)\left(2 + \sqrt{5}\right)\sqrt{5}}{\sqrt{3}}\right)$

D. $\log\left(\frac{\left(2 + \sqrt{3}\right)\left(2 + \sqrt{5}\right)\sqrt{3}}{\sqrt{5}}\right)$

Answer: D

Watch Video Solution

26. The greatest angle of the triangle whose sides are $x^2 + x + 1, 2x + 1$ and $x^2 - 1$ is

A. 75°

B. 90°

C. 105°

D. 120°

Answer: D

Watch Video Solution

27. In a ΔABC, if $a:b:c=4:5:6$, then the ratio of the radius of its circumcircle to that of its incircle

A. $16:7$

B. $12:7$

C. $15:8$

D. $16:9$

Answer: A

Watch Video Solution

28. In triangle ABC, D is mid point of BC, if 'AD' is perpendicular to 'AC then

$\cos A \cos C$

A. $\frac{1}{3}\frac{1c^2 + a^2}{ab}$

B. $\frac{2(c^2 + a^2)}{ab}$

C. $\frac{2(c^2 - a^2)}{3ac}$

D. $\frac{3(a^2 + b^2)}{2bc}$

Answer: C

Watch Video Solution

29. The position vectors of three points A,B and C $(1, 3, x)(3, 5, 8)$ and $(y, -1, -6)$ respectively. IF A, B and C are collinear, then (x,y) =

A. $\left(\frac{2}{3}, -3\right)$

B. $\left(\frac{10}{3}, 3\right)$

C. $\left(\frac{10}{3}, -3\right)$

D. $\left(-3\frac{10}{3}\right)$

Answer: C

Watch Video Solution

30. A line L passes through the poins $\hat{i}+2\hat{j}+\hat{k}$ and $-2\hat{i}+3\hat{k}$. A plane P passes through the origin and the points $4\hat{k}, 2\hat{i}+\hat{j}$. The point where the line L meets the plane P is

A. $-\hat{i}-\hat{j}+3\hat{k}$

B. $-8\hat{i}-4\hat{j}+7\hat{k}$

C. $8\hat{i}+4\hat{j}+\hat{k}$

D. $3\hat{i}+\hat{j}+2\hat{k}$

Answer: B

Watch Video Solution

31. If P, Q, R are the mid-point of the sides AB, BC and CA of ΔABC respectively, then $PC - BQ =$

A. CP

B. PQ

C. BR

D. AR

Answer: A::D

View Text Solution

32. Let $a = \hat{i} + \hat{j}, b = \hat{j} + \hat{k} \text{ and } c = \hat{i} + \hat{k}.$ If d is unit vector such that a.d = 0 and b . $(c \times d) = 0 \text{ and } d =$

A. $\pm \frac{1}{\sqrt{2}}\left(\hat{i} + \hat{j}\right)$

B. $\pm \left(\frac{1}{\sqrt{2}}\hat{j} + \frac{1}{\sqrt{2}}\hat{k}\right)$

C. $\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j} + \frac{1}{\sqrt{3}}\hat{k}$

D. $\pm\left(\frac{1}{\sqrt{2}}\hat{j} + \frac{1}{\sqrt{2}}\hat{k}\right)$

Answer: B

Watch Video Solution

33. If $a = \hat{i} + \hat{j}$ and $b = 3\hat{i} - 2\hat{j}$, then the vector r satisfying the equation $r \times a = b \times a$ and $r \times b = a \times b$ is

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

B. $-\hat{i} - 4\hat{j} - 2\hat{k}$

C. $4\hat{i} + \hat{j}$

D. $4\hat{i} - \hat{j}$

Answer: D

Watch Video Solution

34. The shortest distance between the lines

$r = (3t - 4)\hat{i} - 2t\hat{j} - (1 + 2t)\hat{k}$ and

$r(6 + s)\hat{i} + (2 - 2s)\hat{j} + 2(1 + s)\hat{k}$ is

A. 3

B. 6

C. 9

D. 12

Answer: C

Watch Video Solution

35. Let σ_1, σ_2 be the standard deviations of two distributions D_1 and D_2 respectively and D_1 be more consistent then D_2 If the means of D_1 and D_2 are same, then the percentage increase in the standard deviation of D_2 over the standard deviation of D_1 is

A. $\frac{\sigma_1 - \sigma_2}{\sigma_2} \times 100$

B. $\frac{\sigma_1 - \sigma_2}{\sigma_1} \times 100$

C. $\frac{\sigma_2 - \sigma_1}{\sigma_2} \times 100$

D. $\frac{\sigma_2 - \sigma_1}{\sigma_1} \times 100$

Answer: D

Watch Video Solution

36. Consider the following distribution

x_1	2	4	6	8	10
f_i	1	2	3	2	1

The sum of the mean deviation from the mean and the mean deviation from median of this distribution is

A. 6

B. $\frac{16}{9}$

C. 54

D. $\frac{32}{9}$

Answer: D

Watch Video Solution

37. Ten persons with badges numbered 1 to 10 are in a room. If three of them are asked to leave the room. Then, the probability to have the person with the smallest badge number as 5 among the three persons that left the room, is

A. $\frac{3}{10}$

B. $\frac{1}{6}$

C. $\frac{1}{12}$

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

Answer: C

Watch Video Solution

38. A bag P contains 3 blue and 5 red balls. Another bag Q contains 4 blue and 6 red balls. A ball is drawn at random from one of the bags and is found to be red. The probability that it is from bag Q is

A. $\frac{24}{49}$

B. $\frac{28}{49}$

C. $\frac{36}{49}$

D. $\frac{42}{49}$

Answer: A

Watch Video Solution

39. Match the items from List-I that of List-II A bag contains 4 red , 3 white and 5 blue balls. Three balls are drawn at a time randomly from the bag.

	List-I		List-II
A	Probability of getting 1 red, 1 white and 1 blue ball	(i)	$\frac{3}{44}$
B	Probability of getting 2 white and 1 blue ball	(ii)	$\frac{21}{55}$
C	Probability of getting 2 red and 1 white ball	(iii)	$\frac{38}{55}$
D	Probability that none of the balls is white	(iv)	$\frac{3}{11}$
		(v)	$\frac{9}{110}$

The correct answer is

A. $\begin{matrix} A & B & C & D \\ v & ii & iii & iv \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ iv & i & v & ii \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ iv & i & v & iii \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ v & iii & iv & i \end{matrix}$

Answer: B

Watch Video Solution

40. In a game of throwing 3 coins, a plater will loose Rs.5/-for each head and gain Rs.10/-for each tail. IF a random variable $X : S \rightarrow R$ is defined as X(a)=net gain (a E s) the mean of random variable is (in rupees)

A. $\frac{15}{2}$

B. $-\frac{15}{2}$

C. 15

D. 25

Answer: A

Watch Video Solution

41. A person fails 4 times in a game when he plays 9 times. If he plays 15 times, the probability of having success at most one is

A. $\frac{65}{9}\left(\frac{5}{9}\right)^{14}$

B. $\frac{65}{9}\left(\frac{5}{9}\right)^{15}$

C. $\frac{79}{9}\left(\frac{4}{9}\right)^{14}$

D. $\frac{79}{9}\left(\frac{4}{9}\right)^{15}$

Answer: C

Watch Video Solution

42. If $A = (-1, 2)$ and $B = (1, -2)$ are two points and P is a variable point such that the area of ΔPAB is always one, then the equation of the locus of P is

A. $4x^2 + 4xy + y^2 = 1$

B. $x^2 + 10xy + 25y^2 - 34 - 170y = 0$

C. $x^2 - 6xy + 9y^2 + 22x - 66y - 23 = 0$

D. $16x^2 - 24xy + 9y^2 - 62x + 34y + 46 = 0$

Answer: A

Watch Video Solution

43. The point $(4, 1)$ undergoes the following transformations successively

I. Reflection about the line $y = x$

II. Translation through a distance 2 units in the direction of positive X-axis.

III. Rotation through an angle $\frac{\pi}{4}$ about origin in the anticlock wise direction.

Then, the final position of the point is

A. $\left(\frac{7}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

B. $(\sqrt{2}, 7, \sqrt{2})$

C. $(- \sqrt{2}, 7, \sqrt{2})$

D. $\left(\frac{1}{\sqrt{2}} - \frac{7}{\sqrt{2}}\right)$

Answer: A

Watch Video Solution

44. The image of the point $(2, 4)$ with respect to the straight line $2x + 3y - 6 = 0$ is

A. $\left(-\frac{14}{13}, -\frac{8}{13}\right)$

B. $\left(\frac{14}{13}, \frac{8}{13}\right)$

C. $\left(-\frac{2}{13}, -\frac{4}{13}\right)$

D. $\left(-\frac{2}{7}, -\frac{8}{7}\right)$

Answer: A

Watch Video Solution

45. The equation of the base of an equilateral triangle is $12x + 5y - 65 = 0$. If one of its verices is $(2, 3)$ then the length of the side is

A. $\frac{4}{13}$

B. $\frac{2}{\sqrt{3}}$

C. $\dfrac{4}{\sqrt{3}}$

D. $\dfrac{2}{13}$

Answer: C

Watch Video Solution

46. A triangle is formed by Y-axis, the straight line L passing through the points $(3, 0)\left(1, \dfrac{4}{3}\right)$ and the straight line perpendicular to the line L and passing through the point $(8, 1)$. Then, the area of the triangle (in sq units) is

A. 16

B. 21

C. 36

D. 39

Answer: D

Watch Video Solution

47. For $c \neq 0, c \neq 1$ if the straight line

$x + y = 1, 2x - y = c$ and $bx + 2by = c$ have one common point, then

A. $c < 1b \in \left(-3, \frac{3}{4}\right)$

B. $c > 1 \Rightarrow b \in \left(-\frac{3}{4}, 3\right)$

C. $x < 1 \Rightarrow b \in \left(-3, \frac{3}{2}\right)$

D. $c > 1 \Rightarrow b \in \left(-\frac{3}{4}, \frac{3}{4}\right)$

Answer: A

Watch Video Solution

48. If the lines represented by $x^2 - 2hxy - y^2 = 0$ are rotated about (0,0) through an angle α one in clockwise direaction and the other in the counter clockwise direction, then the combined equation of the bisectors of the angle between the lines thus obtained is

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

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

C. $hx^2 - hy^2 + 2xy = 0$

D. $hx^2 + hy^2 - xy = 0$

Answer: C

Watch Video Solution

49. The normal to a circle $S = 0 at P(1, 3) is x + 2y - 7$ and it has another normal at $Q(3, 5)$ which is the polar of the point $A\left(7, -\frac{1}{2}\right)$ with respect to the circle $x^2 + y^2 - 4x + 6y - 12 = 0.$ Then the equation of the circle S =0 is

A. $x^2 + y^2 - 10x - 2y + 6 = 0$

B. $x^2 + y^2 - 5x - 2y + 1 = 0$

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

D. $x^2 + y^2 - 7x + 3y - 12 = 0$

Answer: A

View Text Solution

50. If $x + ky - 4 = 0$ and $x + y - 5 = 0$ are conjugate lines with respect to the circle

$(x-1)^2 + (y-1)^2 = 3,$ then $k =$

A. 1

B. 2

C. 3

D. 4

Answer: A

Watch Video Solution

51. The length of the chord intercepted by the circle $x^2 + y^2 + 2x + 4y = 20 = 0$ on the line $3x + 4y - 6 = 0$ is

A. $5\sqrt{2}$

B. $\frac{4}{5}\sqrt{21}$

C. $\frac{8}{5}\sqrt{21}$

D. $5\sqrt{2}$

Answer: C

Watch Video Solution

52. Let Q be a point on the circle $B : x^2 + y^2 = a^2$ and p(h,k) be a fixed point. If the locus of the point which divides the join of P and Q in the ratio p:q is a circle C, then the centre of C is

A. $\left(\frac{p+q}{P}, \frac{p+q}{q}\right)$

B. $\left(\frac{hp+kq}{p}, \frac{hp+kq}{q}\right)$

C. $\left(\frac{hq}{p+q}, \frac{kq}{p+q}\right)$

D. $\left(\frac{hq}{p+q}, \frac{kq}{p+q}\right)$

Answer: D

Watch Video Solution

53. The equation of the circle passing through (2a,0) and whose radical axis w.r. to the circle $x^2 + y^2 = a^2$ is $x = a/2$ is

A. centre of C is $(-a, 0)$ and C passes through $(0, 0)$ and $(-a, -a)$

B. circle C is $x^2 + y^2 - 2ax - 2ay = 0$

C. centre of C isw $(a, 0)$ and C passes through (0,) and (a,a)

D. centre of C is $(0, -a)$ and C passes through $(-a, -a)$ and $(0, 0)$

Answer: C

Watch Video Solution

54. If two distinct chords drawn from the point $A(4, 4)$ on the parabola $y^2 = 4x$ are bisected by the lince $y = ax$, then the interval in which a lies is

A. $\left(\frac{1}{2} - \frac{1}{\sqrt{2}}, \frac{1}{2} + \frac{1}{\sqrt{2}}\right)$

B. $\left(-\frac{\sqrt{3}}{2}, \frac{1}{3}\right)$

C. $\left(\frac{1+\sqrt{2}}{2}, \frac{5+\sqrt{2}}{2}\right)$

D. $(2, \infty)$

Answer: A

View Text Solution

55. The locus of the mid-point of the line segment joining the focus to a moving point on the parabola, $y^2 = 4ax$ is a conic. The equation of the directrix of that conic is

A. $y = a$

B. $x = a$

C. $y = 0$

D. $x = 0$

Answer: A

Watch Video Solution

56. For the ellipse $4x^2 + y^2 - 8x + 2y + 1 = 0$, the focus and the equation of the directrix are respectively

A. $\left(-1 - \frac{4}{\sqrt{3}}, 1\right) y + \sqrt{3} + 1 = 0$

B. $\left(-1 - \sqrt{3}, -1\right), \sqrt{3}y + \sqrt{3} + 4 = 0$

C. $\left(1, -1 - \frac{4}{\sqrt{3}}\right), y + \sqrt{3} + 1 = 0$

D. $\left(1, -1 - \sqrt{3}\right), \sqrt{3}y + \sqrt{3} + 4 = 0$

Answer: D

Watch Video Solution

57. If $4x + y + p = 0(p > 0)$ is tangent to the ellipse $x^2 + 3y^2 = 3$ and $16x + qy + 14 = 0(1 > 0)$ is a normal to the ellipse $x^2 + 8y^2 = 33$, then $p + q =$

A. 8

B. 5

C. 9

D. 6

Answer: A

Watch Video Solution

58. The locus of the mid-points of the chords of the circle $x^2 + y^2 = 16$ which are the tangents to the hyperbola $9x^2 - 16y^2 = 144$ is

A. $12x^2 - 8y^2 = x^2 + y^2$

B. $9x^2 + 12y^2 = (x^2 + y^2)^2$

C. $16x^2 - 9y^2 = (x^2 + y^2)^2$

D. $16x^2 - 6y^2 = x^4 + y^4$

Answer: C

Watch Video Solution

59. If the line segment joining the points $P(2, 4, 1)$ and $Q(3, 8, 1)$ is divided by the plane $3x - ky - 6z = 0$ externally in the ratio $4:5$, then k =

A. -1

B. 1

C. 2

D. 3

Answer: B

Watch Video Solution

60. If the directin cosines of two lines satisfy the equation $l+m+n=0$ and $2lm+2\ln-mn=0,$ then the acute angle between those two lines is

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

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

C. $\frac{\pi}{6}$

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

Answer: B

Watch Video Solution

61. The perpendicular distance of the point $(1, -1, 2)$ from the plane $x + 2y + z = 4$, is

A. $\sqrt{17}$

B. $\sqrt{6}$

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

D. $\sqrt{\frac{2}{3}}$

Answer: C

Watch Video Solution

62. If f (x) satisfies $97f(x) + mf\left(\frac{1}{x}\right) = 0,$ where $f(x) = \lim_{n \to \infty} n\left(x^{1/n} - 1\right). X > 0,$ then the value of m is

A. $\frac{1}{97}$

B. 97

C. 0

D. 1

Answer: B

View Text Solution

63. If $f(x)=\begin{cases}\frac{\sqrt{1+ax}-\sqrt{1-ax}}{x}, & -1\leq x<0\\ \frac{x^2+2}{x-2}, & 0\leq x\leq 1\end{cases}$ continuous on $[-1,1]$, then a =

A. -1

B. -2

C. 1

D. 2

Answer: A

Watch Video Solution

64. The function that is not differentiable at $x = 1$ is

A. $f_1(x) = |x|, \; -\infty < x < \infty$

B. $f_2(x) = \begin{cases} 1 + \sin(x - 1), & -\infty < x \leq 1 \\ x, & x \geq 1 \end{cases}$

C. $f_3(x) = \begin{cases} x^2 + 7x - 7, & -\infty < x \leq 1 \\ \frac{3x - 1}{2}, & x \geq 1 \end{cases}$

D. $f_4(x) = \begin{cases} |x - 1| + \; | \; x - 1, & -\infty < x \leq 1 \\ 1 + x - x^3, & x \geq 1 \end{cases}$

Answer: C

View Text Solution

65. match the items of List-I with those of List-II.

List-I	List-II
A $\frac{d}{dx}\left(\tan^{-1}\left(\sqrt{\frac{1-\cos x}{1+\cos x}}\right)\right)$	(i) $\log(x+\sqrt{1+x^2})$
B $\frac{d}{dx^2}\left(\frac{3+\lvert x-1\rvert}{3x+4}\right)$	(ii) $-\frac{4x}{(1+x^2)^2}$
C $\sinh^{-1}x$	(iii) $\frac{1}{2}$
D $\frac{dy^2}{dx^2}\left(\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)\right)$	(iv) $\frac{1}{\sqrt{1+x^2}}$
	(v) not differentiable at $x = 1$

A. $\begin{matrix} A & B & C & D \\ iii & v & iv & ii \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ iv & v & ii & iii \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ i & iii & iv & v \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ iii & iv & i & ii \end{matrix}$

Answer: A

Watch Video Solution

66. If $y = 2\cos(2\log x) + 3\sin(2\log x)$, then $x^2y^2 + xy^1 + 2y =$

A. $-2y$

B. $2y$

C. 0

D. 4

Answer: A

View Text Solution

67. Consider the following statements A is relative error in the area of a square when the relative error in its side os 0.4 B is relative error in the volume of a sphere when the relative error in its radius is 0.3 C is relative error in the surface area of a closed cylinder whose height is equal to its radius, when the relative error in its height is 0.2 D is approximate error in $y = x^2 + x - 3$ when $x = 2$ and $\delta x = 0.1$

The ascending order of the values of errors in these statements is

A. B,C,A,D

B. A,C,B,D

C. C,D,A,B

D. D,A,C,B

Answer: C

View Text Solution

68. If the curves $\frac{x^2}{4}+\frac{y^2}{9}=1$ and $\frac{x^2}{16}-\frac{y^2}{k}=1$ cut each other orthogonally, then k =

A. 144

B. -9

C. 25

D. -21

Answer: D

Watch Video Solution

69. The value C of the Lagrange's mean value theorem for the function $f(x) = x(x-2)$ in the interval $\left[0, \frac{1}{2}\right]$ is

A. $1 - \frac{\sqrt{7}}{2\sqrt{3}}$

B. $1 - \frac{\sqrt{7}}{3}$

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

D. $\frac{1}{6}$

Answer: A

Watch Video Solution

70. If Q is the point on the parabola $y^2 = 4x$ that is nearest to the point $P(2, 0)$ then PQ =

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

71. If $\int \sin^{-1}\left(\sqrt{\frac{x}{a+x}}\right)dx = A(x) +$ constant, then $A(x) =$

A. $a\tan^{-1}\sqrt{\frac{x}{a}} + ax$

B. $\frac{1}{\sqrt{a+x}\tan^{-1}\sqrt{\frac{x}{a}} - \sqrt{ax}}$

C. $(a+x)\tan^{-1}\sqrt{x} + a\sqrt{x}$

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

Answer: D

View Text Solution

72. $\int \frac{\cos 2x.\sin 4x}{\cos^4 x(1+\cos^2 2x)} dx =$

A. $\log\left[\frac{1+\cos^2 x}{1+\cos 2x}\right] - \tan^2 x + c$

B. $\log\left(\frac{1+\cos^2 x}{1+\cos 2x}\right) - \tan^2 x + c$

C. $\log\left(\frac{1+\cos^2 x}{1+\cos 2x}\right) - \sec^2 x + c$

D. $\log\left(\frac{(1+\cos^2 x)^2}{1+\cos 2x}\right) - \sec^2 x + c$

Answer: D

View Text Solution

73. $\int (\log x)^3 x^4 dx$, where $\rho = \log x$

A. $\frac{x^5}{625}[125\rho^3 - 75p^2 + 30p - 6] + c$

B. $\frac{x^5}{625}[125p^3 - 25p^2 + 30\rho - 5] + c$

C. $\frac{x^5}{625}[125p^3 - 60p^2 - 25p + 5] + c$

D. $\frac{x^5}{125}[625p^3 - 75p^2 + 30p + 6] + c$

Answer: A

Watch Video Solution

74. If

$$\int \frac{\sqrt{3}}{\sqrt{x}-\sqrt[3]{x}}dx = x + Ex^{5/6} + Dx^{1/2} + Bx^{1/3} + Ax^{1/6} + \log\left(\sqrt[6]{x}-1\right)^6$$

then $A+B+C+D+E=$

A. $\frac{137}{10}$

B. $\frac{129}{10}$

C. $\frac{119}{10}$

D. $\frac{117}{10}$

Answer: A

View Text Solution

75. $\int_0^{1/2}[\sin 4\pi x]dx =$

A. $\pi - 1$

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

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

D. 0

Answer: C

View Text Solution

76. If $f(n) = \frac{1}{n}\{(n+1)(n+2)....2n\}^{1/n}$ then $\underset{n \to \infty}{Lt} f(n) =$

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

B. $\log\left(\frac{4}{e}\right)$

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

D. $\log\left(\frac{2}{e}\right)$

Answer: A

Watch Video Solution

77. The area of the region bounded by $y = |x|$ and $y = 1 - |x|$ is

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

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

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

D. 1

Answer: B

Watch Video Solution

78. Consider the following differential equations.

$$D_1 : y = 4\left(\frac{dy}{dx}\right)^2 + 3x,\ D_2,\ \frac{d^2y}{dx^2} = \left(3 + \left(\frac{dy}{dx}\right)^2\right)^{\frac{4}{3}} D_3 : \left[1 + \left(\frac{dy}{dx}\right)\right]^2 =$$

The ratio of the sum of the orders of D_1, D_2 and D_3 to the sum of their degrees is

A. $1 : 2$

B. $1:1$

C. $2:3$

D. $3:2$

Answer: C

Watch Video Solution

79. The general solution fo the differential equation $\frac{dy}{dx} = 1 + x + y + xy$ is

A. $\log(1 + x) = y + \frac{x^2}{2} + k$

B. $y = x + \frac{x^2}{2} + k$

C. $\log(1 + y) = \frac{x^3}{3} + k$

D. $y = ke^{x + \frac{x^2}{2}} - 1$

Answer: D

Watch Video Solution

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

A. $x\tan^{-1}y=e^{\left(tna^{-1}y-1\right)}+k$

B. $x\tan^{-1}y=e^{\tan^{-1}}y-1+k$

C. $xe^{tna^{-1}}y=\left(\tan^{-1}y-e^y\right)+k$

D. $x=\left(\tan^{-1}y-1\right)+ke^{-\tan^{-1}}y$

Answer: D

Watch Video Solution