MATHS

BOOKS - MTG MATHS (BENGALI ENGLISH)

QUESTION PAPER 2007

Multiple Choice Questions

1. If α is a complex number such that $\alpha^2 + \alpha + 1 = 0$, then the value of α^{61} is

A. 1

B. -1

C. α

D. $-\alpha$

Answer:

Watch Video Solution

2. 12 balls are kept in 3 different pots. The probability that the pot contains 3 balls in

A. $\frac{2^t}{3^{11}}$

B. $\frac{12e_1 + 2^{12}}{3^{12}}$

C. $\frac{12e_1 + 2^t}{3^{12}}$

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

Answer:

Watch Video Solution

3. The system of equations

$$ax + y + z = 0$$

$$-x + ay + z = 0$$

$$-x + ay + z = 0$$

$$-x - y + az = 0$$

has a non - zero solution if the real value a is

A. 1

B. -1

C. 3

D. 0

Answer:

Watch Video Solution

4. The positive integer which exactly divides the number $\left(3 \times 5^{2n+1} + 2n^{3n+1}\right)$ for all $n \varepsilon N$ is

A. 17

B. 19

C. 21

D. 23

Answer:

Watch Video Solution

5. If two events A and B are such that $P(A^c) = 0.3, P(B) = 0.4$ and $P(A \cap B^c) = 0.5$, then $P(B \mid A \cup B^c)$ is

A. 0.9

B. 0.25

C. 0.5

D. 0.8

Answer:

Watch Video Solution

6. Amplitude of $\frac{1-i}{1+i}$ is

A. $-\frac{\pi}{2}$

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

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

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

Answer:

Watch Video Solution

7. The domain of definition of the function $f(x) = \sin^{-1}(|x-1|-2)$ is

A. $[-2, 0] \cup [2, 4]$

B. $[-2, 0] \cup [1, 3]$

C. $[-2, 0] \cup (2, 4)$

D. $(2, 0) \cup (2, 4)$

Answer:

Watch Video Solution

8. Sum of the last 24 coefficient, in the expansion of $(1+x)^{47}$, when expanded in ascending powers of x is

A. 2^{46}

B. 2^{23}

C. 2^{24}

D. 2^{47}

Answer:

Watch Video Solution

9. Let α, β be the roots of $x^2 + (3 - \lambda)x - \lambda = 0$. The value of λ for which $\alpha^2 + \beta^2$ is minimum is

A. 1

B. 3

C. 2

D. 0

Answer:

Watch Video Solution

10. The line $y = \sqrt{3}x$ bisects the angle between the lines $ax^2 + 2axy + y^2 = 0$ if a is equal to

A. $2 - \sqrt{3}$

B. $2 + \sqrt{3}$

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

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

Answer:

Watch Video Solution

11. The eccentricity of an ellipse, the length of whose minor axis is equal to the distance between the foci, is

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

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

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

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

Answer:

Watch Video Solution

12. The equation of a tangent to the hyperbola $x^2 - 2y^2 = 2$ parallel to the line $2x - 2y + 5 = 0$ is

A. $y = 2x + 1$

B. $y = 2x - 1$

C. $y = x \pm 1$

D. $x + y + 1 = 0$

Answer:

Watch Video Solution

13. Let $f(x) = x, |x|$. The set of points where f (x) is twice differentiable is

A. $\forall x \in R$

B. $\forall x \in R - (0)$

C. $\forall x \in R - (0, 1)$

D. $\forall x \in R - (1)$

Answer:

Watch Video Solution

14. If $f(x+y)=f(x)+f(y)$ for all real x and y and if f (x) is continuous at $x=\sqrt{3}$, then

A. f (x) is not continuous at $x=-\sqrt{3}$

B. f (x) is everywhere continuous except at $x=-\sqrt{3}$

C. f (x) is not continuous at x = 0

D. f (x) is continuous for all real x

Answer:

Watch Video Solution

15. If the straight line $y = 4x - 5$ touches the curve $y^2 = px^3 + q$ at (2, 3) then

A. p = 2, q = 7

B. $p = 2, q = -7$

C. $p = -2, q = 7$

D. $p = -2, q = -7$

Answer:

Watch Video Solution

16. If A and B are square matrices of the same order, then AB = 0 implies

A. both A and B are non - singular

B. A is non - singular and B is singular

C. A is singular and B is non - singular

D. either A = 0 or B = 0 or both A and B are singular matrices

Answer:

Watch Video Solution

17. If the sum of the roots of the equation $2x^2 + 4x + C = 0$ be equal to the sum of their square then

A. C = 2

B. $C = -6$

C. C = 4

D. C = 6

Answer:

Watch Video Solution

18. If in an arithmetic progression, the sum of n terms is equal to the sum of r terms then the sum of $(n + r)$ terms is

A. $n + r$

B. -1

C. 1

D. 0

Answer:

Watch Video Solution

19. If $f(x) = x(x-1)(x-2), 0 \leq x \leq 4$, then the point ξ which satisfies Mean Value Theorem satisfies

A. $0 < \xi < 1$

B. $\xi > 3$

C. $0 < \xi < \frac{1}{2}$

D. $1 < \xi < 3$

Answer:

Watch Video Solution

20. If $\log_a x = y$, then the value of $\log_a\left(\frac{a}{x}\right)$ is

A. $1 - y$

B. $1 + y$

C. y

D. $-y$

Answer:

Watch Video Solution

21. The sides of the rectangle of the greatest area that can be inscribed in the ellipse $x^2 + 2y^2 = 8$ are given by

A. $4, 2\sqrt{2}$

B. $2, 4\sqrt{2}$

C. $\sqrt{2}, 4$

D. $2\sqrt{3}, 4$

Answer:

Watch Video Solution

Watch Video Solution

22. The polar co-ordinates of the point $\left(-\sqrt{3}, 1\right)$ are

A. $\left(2, \frac{5\pi}{6}\right)$

B. $\left(2, \frac{3\pi}{6}\right)$

C. $\left(2, \frac{-5\pi}{6}\right)$

D. $\left(2, \frac{-3\pi}{6}\right)$

Answer:

Watch Video Solution

23. If two sides of a triangle are $2\sqrt{3}-2$ and $2\sqrt{3}+2$ and their included angle is 60°, then the other angles are

A. $75^\circ, 45^\circ$

B. $105^\circ, 15^\circ$

C. $60^\circ, 60^\circ$

D. $90^\circ, 30^\circ$

Answer:

Watch Video Solution

24. The solution of the equation $\frac{dy}{dx} = xy + y$ subject to the conditions, y = 1, at x = 1, is

A. $\left(e^{x+R1/2}\right)e^{3/2}$

B. $\left(e^{2x} + x^2\right)e^{1/3}$

C. $\left(e^{x/2} + x^3\right)e^{1/2}$

D. $\left(e^{2z+x/2}\right)e^{2/3}$

Answer:

Watch Video Solution

25. An integrating factor of the differential equation $\frac{dy}{dx}(x \log x) + 2y = \log x$ is

A. $(\log x)^2$

B. x^2

C. log x

D. $\frac{1}{\log x}$

Answer:

Watch Video Solution

26. Which one of the following is incorrect for any two events A and B ?

A. $P(A \cap B) \geq P(A) + P(B) - 1$

B. $P(A \cap B) \leq P(A)$

C. $P(A^c \cap B^c) = 1 - P(A \cap B)$

D. $P(A) \leq P(A \cup B)$

Answer:

Watch Video Solution

27. The sum of the infinite series $1 + \frac{1}{\lfloor 2} + \frac{1.3}{\lfloor 4} + \frac{1.3.5}{\lfloor 6} + \ldots\ldots\ldots$ is

A. $\sqrt{e}$

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

C. $e^2 - e$

D. $2e + 1$

Answer:

Watch Video Solution

28. Two mappings $f: R \to R$ and $g: R \to R$ are defined in the following ways :

$$f(x) = \begin{cases} 0 \text{ when x is rational} \\ 1 \text{ where x is irrational} \end{cases}, g(x) = \begin{cases} -1 \text{ when x is rational} \\ 0 \text{ when x is irrational} \end{cases}$$

,

then the value of $(gof)(e) + (fog)(\pi)$ is

A. -1

B. 1

C. 0

D. 2

Answer:

Watch Video Solution

29. If the arithmetic mean of the roots of $x^2 - 2ax + b = 0$ is A and the geometric mean of the roots of $x^2 - 2bx + a^2 = 0$ is G, then

A. A = G

B. $A > G$

C. $G > A$

D. $AG = a^2 + b^2$

Answer:

Watch Video Solution

30. Let $y = a(1 - \cos\theta), x = a(\theta - \sin\theta)$. Then y regarded as a function of x is maximum when θ equals

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

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

C. π

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

Answer:

Watch Video Solution

31. Let $I = \int_{-2}^{+2} \{x - [x]\}dx$ when [x] represents the greatest integer not greater than x. Then the value of I is

A. 4

B. 2

C. 3

D. 1

Answer:

Watch Video Solution

32. A particle moves according to the law $s = t^3 - 9t^2 + 24t$. The distance covered by the particle before it first comes to rest is -

A. 10 units

B. 16 units

C. 20 units

D. 24 units

Answer:

Watch Video Solution

33. The value of $\int \frac{1}{e^x + e^{-x}} dx$ is

A. $\tan^{-1} e^x$

B. $\tan^{-1} e^{2x}$

C. $\log\left(e^x + e^{-x}\right)$

D. $e^x - e^{-x}$

Answer:

Watch Video Solution

34. If $f'(2) = 1$, then $\lim_{h \to 0} \frac{f(2+h) - f(2-h)}{2h}$ is equal to

A. 0

B. 1

C. 2

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

Answer:

Watch Video Solution

35. Two fair dice are thrown. The probability that the sum of the numbers on the upper face is 5, is

A. $\frac{2}{9}$

B. $\frac{1}{18}$

C. $\frac{1}{9}$

D. $\frac{4}{9}$

Answer:

Watch Video Solution

36. The sum of all the coefficients in the expansion of $\left(x^2+\frac{1}{x}\right)^n$ is 1024. The value of n is

A. 12

B. 8

C. 14

D. 10

Answer:

Watch Video Solution

37. The domain of definition of the function $f(x) = \sin^{-1}(|x-1|-2)$ is

A. $[-2, 0] \cup [1, 3]$

B. $[-2, 0] \cup [1, 4]$

C. $[-2, 0] \cup [2, 4]$

D. $[-2, 0] \cup [1, 2]$

Answer:

Watch Video Solution

38. Using calculus, find the area bounded by the curve |x|+|y|=1.

A. 2

B. 4

C. 6

D. 8

Answer:

Watch Video Solution

39. The number of tangents that can be drawn from the point (6, 2) on the hyperbola $\frac{x^2}{9} - \frac{y^2}{4} = 1$ is

A. 0

B. 1

C. 2

D. 4

Answer:

Watch Video Solution

40. The value of the integral $\int_1^e (\log x)^2 dx$ is

A. e

B. 2e

C. $e - 1$

D. $e - 2$

Answer:

Watch Video Solution

41. The value of $\sum_{r=1}^{5} \left(i^r - i^{r+1}\right)$ is, where $i = \sqrt{-1}$

A. $i - 1$

B. $3i + 3$

C. $5i - 5$

D. $i + 1$

Answer:

Watch Video Solution

42. If (m, n) represent respectively the order and degree of the differntial equation $\frac{d^2y}{dx^2} + 3\left(\frac{dy}{dx}\right)^2 = \log\left(\frac{d^2y}{dx^2}\right)$ then (m, n) = ...

A. (2, 2)

B. (2, 1)

C. (1, 2)

D. (2, undefined)

Answer:

Watch Video Solution

43. The solution of the differential euation $\frac{dy}{dx} = \frac{x-y}{x+y}$ is

C is integration constant.

A. $x^2 - y^2 + 2xy + C = 0$

B. $x^2 - y^2 + xy + C = 0$

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

D. $x^2 - y^2 - 2xy + C = 0$

Answer:

Watch Video Solution

44. The general solution of the equation $ydx + (x + \cos y)dy = 0$ is

A. $xy + \sin y = c$

B. $xy - \sin y = c$

C. $x + y\cos y = c$

D. $xy + \cos y = c$

Answer:

Watch Video Solution

45. The letters of the word 'TRIANGLE' are arranged in a row in all possible ways. How many of them begin with A and end with N ?

A. 120

B. 720

C. 1680

D. 60

Answer:

Watch Video Solution

46. If in an infinite G.P. series, the first term is 'a' and the sum is 3, then 'a' must satisfy

A. $a < -1$

B. $a > 9$

C. $0 < a < 3$

D. $-6 < a < 0$

Answer:

Watch Video Solution

47. If n is an integer greater than 1, then the value of $a - {}^{n}c_1(a-1) + {}^{n}c_2(a-2) + \ldots + (-1)^{n}(a-n)$ is

A. a^n

B. $(-a)^n$

C. 0

D. 1

Answer:

Watch Video Solution

48. $y = f(x) = x^2 - x + 10$ is

A. an increasing function in $\left(\frac{1}{2}, \alpha\right)$

B. an increasing function in $\left[-\frac{1}{3}, \frac{2}{3}\right]$

C. an increasing function in $\left[\frac{2}{3}, \alpha\right]$

D. a decreasing function in $\left[\frac{1}{3}, \alpha\right]$

Answer:

Watch Video Solution

49. If $f(x) = \mu x - \sin x$ is strictly increasing then

A. $\mu > -1$

B. $\mu < 1$

C. $\mu > 1$

D. $\mu < -1$

Answer:

Watch Video Solution

50. If A and B are two square matrices of the same order such that AB = A, BA = B and if a matrix A is called idempotent if $A^2 = A$, then

A. A is idempotent but not B

B. B is idempotent but not A

C. neither A nor B is idempotent

D. both A and B are idempotent

Answer:

Watch Video Solution

51. If x and a are real, then the value of a for which the expression $x^2 - \frac{3a}{2}x + 1 - a^2$ is positive, is

A. $a > -\frac{4}{25}$

B. $a < \frac{4}{25}$

C. $|a| > \frac{4}{5}$

D. $|a| < \frac{4}{5}$

Answer:

Watch Video Solution

52. The differential equation of the family of parabolas whose vertex is at (1, 2) and axis is parallel to x - axis is

A. $2\frac{dy}{dx}(x-1)=y-2$

B. $x\frac{dy}{dx}=y-2$

C. $\left(\frac{dy}{dx}\right)^2-3xy=0$

D. $\frac{dy}{dx}(x-1)=y-2$

Answer:

Watch Video Solution

53. The solution of $\frac{dy}{dx}=xy+2y$ subject to the condition y = 1 at x = 1 is

A. $y=\left[e^{2x+x2/2}\right]e^{-2}$

B. $y=\left[e^{2x}+x2/2)\right]e^{-3/2}$

C. $y=\left[e^{2x+x2/2}\right]e^{-2/3}$

D. $y=\left[e^{2x+x2/2}\right]e^{-5/2}$

Answer:

Watch Video Solution

54. The sum of the first 26 odd positive integers is

A. 26^1

B. 26^3

C. 26^4

D. 26^2

Answer:

Watch Video Solution

55. If Z_1 and Z_2 are two non-zero complex numbers such that $|Z_1 + Z_2| = |Z_1| + |Z_2|$, then arg $Z_1 -$ arg Z_2 is

A. 0

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

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

D. 1

Answer:

Watch Video Solution

56. The solution of $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} = 0$ is

A. $y = A + Be^{4x}$

B. $y = A\cos 2x + B\sin 2x$

C. $y = (A + Bx)e^{4x}$

D. $y = Ae^{2x} + Be^{-2x}$

Answer:

Watch Video Solution

57. If the coefficients of 2nd, 3rd and 4th terms of $(1 + x)^{2n}$ are in A.P., then n equals

A. $\frac{7}{2}$

B. $\frac{11}{2}$

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

D. 3

Answer:

Watch Video Solution

Watch Video Solution

58. A particle is projected vertically upwards with a velocity of 4900 cm/sec. The distance traversed in the last second by the particle during its ascent $\left(g = 980cm / \sec^2\right)$ is

A. 490 cm

B. 940 cm

C. 980 cm

D. 400 cm

Answer:

Watch Video Solution

59. The value of $\sin(-300^\circ)$ is

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

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

C. $\sqrt{3}$

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

Answer:

Watch Video Solution

60. The solution of the differential equation $\frac{dy}{dx} = e^{x-y} + 1$ is

A. $e^{x-y} = x + c$

B. $e^{y-x} = x + c$

C. $e^{x-y} = y + c$

D. $e^{y-x} = y + c$

Answer:

Watch Video Solution

61. The area of the region bounded by the curves $y = x^2$ and $x = y^2$ is

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

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

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

D. 3

Answer:

Watch Video Solution

62. If $f(x) = |x| + |1 - x|, \ -2 \leq x \leq 3$, then the set of points of discontinuity of f (x) is

A. $\{0, 1\}$

B. $\{1\}$

C. $\{0, 1, 2, 3\}$

D. $\{-1, 0, 1, 2, 3\}$

Answer:

Watch Video Solution

63. Two cars start moving from the junction point of two perpendicular roads with velocity 30 km/h and 40 km/h. The rate at which thay are separating is

A. 35 km/h

B. 30 km/h

C. 10 km/h

D. 50 km/h

Answer:

Watch Video Solution

64. The value of $\lim_{x \to 0} \frac{1 - \cos x}{x^2}$

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

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

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

D. 0

Answer:

Watch Video Solution

65. If $A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$ then A^{-1} is

A. $-\frac{1}{9}A$

B. $\frac{1}{9}A$

C. $\frac{1}{19}A$

D. $-\frac{1}{19}A$

Answer:

Watch Video Solution

66. The value of x, for which $\log_3\left(5.3^{x-1}+1\right), \log_9\left(3^{1-x}+1\right)$ and 1 are in A.P. is

A. $\log_3 \frac{5}{3}$

B. $\log_3 \frac{3}{5}$

C. $\log_3 \frac{3}{2}$

D. $\log_3 \frac{2}{5}$

Answer:

Watch Video Solution

67. A point moves in such a manner that the sum of the squares of the distances from it to the points (a, 0) and (-a, 0) is $2b^2$. The locus of the point is

A. $x^2 + y^2 = b^2 + a^2$

B. $x^2 + y^2 = b^2 - a^2$

C. $x^2 - y^2 = b^2 - a^2$

D. $x^2 - y^2 = b^2 + a^2$

Answer:

Watch Video Solution

68. If the roots of the equation $x^2 + \alpha^2 = 8x + 6\alpha$ are real, then which one is correct ?

A. $-2 \leq \alpha \leq 8$

B. $2 \leq \alpha \leq 8$

C. $-2 < \alpha \leq 8$

D. $-2 \leq \alpha < 8$

Answer:

Watch Video Solution

69. If two circles $x^2 + y^2 + 2gx + 2fy = 0$ and $x^2 + y^2 + 2g'x + 2f'y = 0$ touch each then

A. $ff' = gg'$

B. $fg' = f'g$

C. $f^2 + f'^2 = g^2 + g'^2$

D. $f^2 + g^2 = f'^2 + g'^2$

Answer:

Watch Video Solution

70. The point on the curve $y^2 = x$, the tangent at which makes an angle 45° with the x-axis, is

A. (0, 0)

B. $\frac{1}{2}, \frac{1}{4}$

C. $\frac{1}{4}, \frac{1}{2}$

D. (2, 4)

Answer:

Watch Video Solution

71. $\lim_{x \to \infty} \left(1 + \frac{1}{x}\right)^{x/2}$ is equal to

A. e

B. e^{-1}

C. e^2

D. $e^{1/2}$

Answer:

Watch Video Solution

72. The value of $\lim_{n \to \infty} \left[\frac{n!}{n^n}\right]^{\frac{1}{n}}$ is equal to -

A. $(n+1)! \times \left({}^{2n}C_n\right)$

B. $n! \times \left({}^{2n}C_n\right)$

C. $n! \times \left({}^{2n+1}C_n\right)$

D. $n! \times \left({}^{2n+1}C_{n+1}\right)$

Answer:

Watch Video Solution

73. If $y = \frac{1}{1+x+x^2+x^3}$, then the value of $\frac{d^2y}{dx^2}$ at $x = 0$ is -

A. $\frac{9}{4}$

B. $-\frac{9}{4}$

C. $\frac{9}{8}$

D. $-\frac{9}{8}$

Answer:

Watch Video Solution

74. Three integers form an increasing G.P. If the third number is decreased by 16, we get an A.P. If then the second number is decreased by 2, we again get a G.P. The smallest number of the original G.P. is

A. 3

B. 1

C. 5

D. 7

Answer:

Watch Video Solution

75. The probability that 3 students can solve a mathematics problem independently is $\frac{1}{3}, \frac{1}{4}$ and $\frac{1}{5}$ respectively. The chance that the problem is solved is

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

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

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

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

Answer:

Watch Video Solution

76. The sum of first n terms of a series is $3^n(a+b)$ when a, b are constants. Then the terms of the series are in

A. A.P.

B. G.P.

C. A.P. from the second term onwards

D. G.P. from the second term onwards

Answer:

Watch Video Solution

77. A and B are subsets of the universal set $\cup$ such that $n(\cup) = 800, n(A) = 300, n(B) = 400$ and $n(A \cap B) = 100.$ The number of elements in the set $A^c \cap B^c$ is equal to

A. 100

B. 200

C. 300

D. 400

Answer:

Watch Video Solution

78. If $x^2 + y^2 = 1$, the minimum and maximum values of $x + y$ are

A. $-\sqrt{2}, \sqrt{2}$

B. $-1, 1$

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

D. $-\frac{1}{\sqrt{2}}, 2$

Answer:

Watch Video Solution

79. Let $f(x) = a^x (a > 0)$ be written as $f(x) = g(x) + h(x)$, when g (x) is an even function and h (x) is an odd function. Then the value of $g(x+y) + g(x-y)$ is

A. $2g(x)h(y)$

B. $2g(x+y)g(x-y)$

C. $2g(x)$

D. $g(x)h(x)$

Answer:

Watch Video Solution

80. $A = \begin{bmatrix} -i & 0 \\ 0 & i \end{bmatrix}$ then $A^T A =$

(where I is 2×2 identity matrix)

A. I

B. $-I$

C. A

D. $-A$

Answer:

Watch Video Solution

81. Show that ,the maximum value of $\left(\frac{1}{x}\right)^x$ is $e^{\frac{1}{e}}$

A. e^e

B. e^{-e}

C. $-e^e$

D. $e^{1/2}$

Answer:

Watch Video Solution

82. The value of the integeral $\int_{-\pi/7}^{\pi/7} x^3 \cos^2 x dx$ is

A. 0

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

C. 1

D. -1

Answer:

Watch Video Solution

83. The sum of the series $1+\frac{1}{3.9}+\frac{1}{5.81}+\frac{1}{7.729}+\ldots\ldots$ to ∞ is

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

B. $\frac{2}{3}\log_{10}\frac{3}{2}$

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

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

Answer:

Watch Video Solution

Watch Video Solution

84. Using integration find the area of the region bounded by the parabola $y^2 = 16x$ and the line x = 4

A. 12

B. 16

C. 3

D. 6

Answer:

Watch Video Solution

85. If m and n denote respectively the order and degree of a differential equation, then for the equation

$\left[a+\left(\frac{dy}{dx}\right)^n\right]^{\frac{7}{3}}=b\frac{d^2y}{dx^2}$, the value of (m,n) will be

A. (1, 7)

B. (1, 6)

C. (2, 5)

D. (2, 6)

Answer:

Watch Video Solution

86. A particle is moving along the x - axis in such a way that it has displacement $s=3t^3-2t^2$ at time t. The interval of time for which the particle remains in the negative x-axis is given by

A. $0<t<\frac{2}{3}$

B. $0<t<\frac{3}{2}$

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

D. $0 < t < 1$

Answer:

Watch Video Solution

87. The identity mapping $I_c : S \to S$ is defined as $I_s(x) = x$ for $x \in S$. Suppose $f : A \to B$ is a bijection, then which one of the following is true ?

A. $f^{-1}0f \neq I_A$ but $f0f^{-1} = I_B$

B. $f^{-1}0f = I_A$ but $f0f^{-1} = I_B$

C. $f^{-1}0f = I_A$ but $f0f^{-1} \neq I_B$

D. $f^{-1}0f \neq I_A$ and $f0f^{-1} \neq I_B$

Answer:

Watch Video Solution

88. If $z = x + iy$ and $\arg\left(\frac{z-1}{z+1}\right) = \frac{\pi}{4}$, then the locus of (x, y) is

A. an ellipse

B. straight line

C. a circle with centre (0, 1)

D. a circle with centre (1, 0)

Answer:

Watch Video Solution

89. Solve the equation $\frac{dy}{dx} + \frac{y}{x} = x^2$

A. $\frac{d^2y}{dx^2} = 8y$

B. $\frac{d^2y}{dx^2} = 16y$

C. $\frac{d^2y}{dx^2} = y$

D. $\frac{d^2y}{dx^2} = 4y$

Answer:

Watch Video Solution

90. A partiole is moving in a straight line such that its velocity at time t is proportional to t^5. Then its acceleration is proportional to

A. t^4

B. t^5

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

D. t

Answer:

Watch Video Solution

91. For an integrable function f (x) in $[-3, 3]$, which of the following is correct ? $\int_3^3 f(x)dx = 0$ when f (x) is

A. an odd function

B. an even function

C. only a trigonometric function

D. any function

Answer:

Watch Video Solution

92. The area bounded by the parabola $y^2 = 2x + 1$ and the line $x - y = 1$ is

A. $\frac{16}{3}$

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

C. $\frac{24}{5}$

D. $\frac{18}{4}$

Answer:

Watch Video Solution

93. If the circles $x^2 + y^2 - 4rx - 2ry + 4r^2 = 0$ and $x^2 + y^2 = 25$ touch each other, then r satisfies

A. $4r^2 + 10r \pm 25 = 0$

B. $5r^2 + 10r \pm 16 = 0$

C. $4r^2 \pm 10r + 25 = 0$

D. $4r^2 \pm 10r - 25 = 0$

Answer:

Watch Video Solution

94. The minimum value of $6\cos\alpha + 8\sin\alpha + 11$ is

A. 0

B. 1

C. 2

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

Answer:

Watch Video Solution

95. If α, β be the roots of the equation $x^2 + x + 1 = 0$, the value of $\alpha^4\beta^4 - \alpha^{-1}\beta^{-1}$ is

A. -1

B. 1

C. 0

D. 2

Answer:

Watch Video Solution

96. If $A = \begin{bmatrix} 0 & 3 \\ 4 & 5 \end{bmatrix}$ and $kA = \begin{bmatrix} 0 & 4a \\ 3b & 60 \end{bmatrix}$, then the values of k, a and b are respectively

A. $12, 9, 16$

B. $9, 12, 16$

C. $12, 9, 15$

D. $16, 9, 12$

Answer:

Watch Video Solution

97. Let $f(x) = \frac{ax}{x+1}, x \neq 1$, then the value of 'a' for which $f[f(x)] = x$ is

A. $\sqrt{2}$

B. $-\sqrt{2}$

C. 1

D. -1

Answer:

Watch Video Solution

98. If $x \in [0, 6]$, the probability that the expression $x^2 - 7x + 10 \geq 0$ is

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

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

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

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

Answer:

Watch Video Solution

99. Let $f(x+y)=f(x)f(y)\,\forall x,\ \in IR, f(6)=5$ and $f'(0)=1$. Then the value of f' (6) is

A. 5

B. 30

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

D. 36

Answer:

Watch Video Solution

100. If the ratio of the sides of a triangle is 4 : 5 : 7, then the triangle must be

A. right - angled

B. actute - angled

C. obtuse - angled

D. right - angled and isosceles

Answer:

Watch Video Solution