MATHS

BOOKS - KC SINHA MATHS (HINGLISH)

MATRICES - FOR COMPETITION

Solved Examples

1. If A,B,C are three matrices such that

$A = \begin{bmatrix} x & y & z \end{bmatrix}, B = \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}, C = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ Find ABC.

Watch Video Solution

2. Find X if $Y = [3214]$ and $2X + Y = [10 - 32]$.

Watch Video Solution

3. If $A = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$, find AB and BA and show that $AB \neq BA$

Watch Video Solution

4. If $A = |122212221|$, verifty that $A^2 - 4A - 5I = 0$

Watch Video Solution

5. If $A = [10 - 17]$, find k such that $A^2 - 8A + kI = O$.

Watch Video Solution

6. If $A = f(x) = \begin{bmatrix} \cos x & \sin x & 0 \\ -\sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$, then the value of $A^{-1} =$ (A) $f(x)$ (B) $-f(x)$ (C) $f(-x)$ (D) $-f(-x)$

Watch Video Solution

7. If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ then $\lim_{n \to \infty} \frac{A^n}{n} is (where \theta \varepsilon R)$ (A) an idenity matrix (B) a zero matrix (C) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 1 \\ -1 & -0 \end{bmatrix}$

Watch Video Solution

8. If $A = \begin{bmatrix} 0 & 1 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix}$ is a matrix of order 3 then the value of the matrix $(I + A) - 2A^2(I - A)$, where I is a unity matrix is equal to (A) $\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & -1 & -1 \\ 0 & 1 & -1 \\ 0 & 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 1 & -1 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 0 & 2 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$

Watch Video Solution

9. If A and B are square matices of the same order such that $A^2 = A, B^2 = B, AB = BA = 0$ then (A) $AB^2 = 0$ (B) $(A + B)^2 = A + B$ (C) $(A - B)^2 = A + B$ (D) none of these

Watch Video Solution

10. Let $f(x) = \begin{bmatrix} \cos x & -\sin x & 0 \\ \sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}, then$ (A) $(f(x))^2 = -I$ (B) $f(x+y) = f(x), f(y)$ (C) $f(x)^{-1} = f(-x)$ (D) $f(x)^{-1} = f(x)$

Watch Video Solution

11. If D_1 and D_2 are diagonal matices of order 3×3 then (A) D_1^n is a diagonal matrix (B) $D_1 D_2 = D_2 D_1$ (C) $D_1^2 + D_2^2$ is diagonal matrix (D) $D_1 D_2$ is a diagonal matix

Watch Video Solution

12. For a matrix A of order 3×3 where $A = \begin{bmatrix} 1 & 4 & 5 \\ k & 8 & 8k-6 \\ 1+k^2 & 8k+4 & 2k+21 \end{bmatrix}$ (A) rank of $A = 2f$ or $k = -1 (B) rnkof$A=1 or k=-1$(C) rankof$A=2 for k=2 $(D) rankof A = 1f$ or $k = 2$

Watch Video Solution

13. Let A and B be two matrices of the same order 3×3 such that $A = \begin{bmatrix} -5 & 1 & 3 \\ 7 & 1 & -5 \\ 1 & -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 1 & 2 \\ 3 & 2 & 1 \\ 2 & 1 & 3 \end{bmatrix} x + y + 2z = 1, 3x + 2y + z$

and$2x + y + 3z = 2$ be a system of equatons in x,y,z The value of AB and

hence solve the system of equation

(A) $\begin{bmatrix} -5 & 1 & 5 \\ 21 & 2 & -5 \\ 2 & -1 & 3 \end{bmatrix}$ (B) $\begin{bmatrix} 4 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 4 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & -5 & 1 \\ 1 & 3 & 6 \\ 0 & 0 & -0 \end{bmatrix}$

Watch Video Solution

Exercise

1. Given $A = \begin{bmatrix} 1 & 2 & -3 \\ 5 & 0 & 2 \\ 1 & -1 & 1 \end{bmatrix}$ and $b = \begin{bmatrix} 3 & -1 & 2 \\ 4 & 2 & 5 \\ 2 & 0 & 3 \end{bmatrix}$, find the matrix C such that $A + C = B$.

Watch Video Solution

2. If $P(x) = \begin{bmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{bmatrix}$, then show that $P(x).\,P(y) = P(x+y) = P(y).\,P(x)$.

Watch Video Solution

3. Find the product of the following two matrices $\begin{bmatrix} 0 & c & -b \\ c & 0 & a \\ b & -a & 0 \end{bmatrix}$ and $\begin{bmatrix} a^2 & ab & ac \\ ab & b^2 & bc \\ ac & bc & c^2 \end{bmatrix}$.

Watch Video Solution

4. If $f(x) = x^2 - 5x + 6$. Find $f(A)$, if $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$.

Watch Video Solution

5. Let $A = [0 - \tan(\alpha/2)\tan(\alpha/2)0]$ and I be the identity matrix of order 2. Show that $I + A = (I - A)[\cos\alpha - \sin\alpha \sin\alpha \cos\alpha]$.

Watch Video Solution

6. If $A=[3-41-1]$, then prove that $A^n=[1+2n-4\cap 1-2n]$, where n is any positive integer.

Watch Video Solution

7. Let $A=[0100]$show that $(aI+bA)^n=a^nI+na^{n-1}bA$, where I is the identitymatrix of order 2 and $n\in N$.

Watch Video Solution

8. A man buys 8 dozens of magones, 10 dozens of appes and 4 dozens of basnanas. Mangoes cost Rs. 18 per dozen, apples Rs. 9 per dozen nd bananas Rs. 6 per dozen. Represent the quantities bought by a row matrix and the prices byka column matrix and hence obtain the total cost.

Watch Video Solution

9. Express the following matrilx as the sum of a symmetric and skey symmetric matrix $\begin{bmatrix} 1 & 2 & 4 \\ 6 & 8 & 1 \\ 3 & 5 & 7 \end{bmatrix}$

Watch Video Solution

10. Solve the following system of linear equations by matrix method: $3x - 2y = 7, 5x + 3y = 1$

Watch Video Solution

11. Use matrix method to solve the equations $5x - 7y = 2$ and $7x - 5y = 3$

Watch Video Solution

12. Solve the following system of linear equations by matrix method:

$2x + 3y + 3z = 1, 2x + 2y + 3z = 2, x - 2y + 2z = 3$

Watch Video Solution

13. Solve the following system of linear equations by matrix method:

$x + y + z = 3, 2x - y + z = 2, x - 2y = 3z = 2$

Watch Video Solution

14. If A is an invertible symmetric matrix the A^{-1} is

A. a diagonal matrix

B. symmetric

C. skew symmetric

D. none of these

Watch Video Solution

15. If A is a skew-symmetric matrix and n is odd positive integer, then A^n is a skew-symmetric matrix a symmetric matrix a diagonal matrix none of these

Watch Video Solution

16. Which of the following is no true? (A) $(A')' = A$ (B) $(A - I)(A + I) = 0$ such that $A^2 = I$ (C) $(AB)^n = A^n B^n where n \varepsilon N$ and $AB = BA$ (D) $(A + B)(A - B) = A^2 - B^2$, A and B being square matrices of the same type

Watch Video Solution

17. A square matrix A is invertible iff det (A) is equal to (A) -1 (B) 0 (C) 1 (D) none of these

Watch Video Solution

18. If A,B and C be the three square matrices such that $A = B + C$ then det A is necessarily equal to (A) detB (B) det C (C) det$B + \det C$ (D) none of these

Watch Video Solution

19. A square matix A is called idempotent if (A) $A^2 = 0$ (B) $A^2 = I$ (C) $A^2 = A$ (D) $2A = I$

Watch Video Solution

20. The value of det $\begin{vmatrix} a & 0 & 0 & 0 \\ 2 & b & 0 & 0 \\ 4 & 6 & c & 0 \\ 6 & 8 & 10 & d \end{vmatrix} is (A) 0 (B)$a+b+c+d$(C)$abcd` (D) none of these

Watch Video Solution

21. If A and B are any two square matrices of the same order then

(A) $(AB)^T = A^T B^T$

(B) $(AB)^T = B^T A^T$

(C) $Adj(AB) = adj(A)adj(B)$

(D) $AB = 0 \rightarrow A = 0 \text{ or } B = 0$

Watch Video Solution

22. A square matix AS is a called singular if det A is (A) negative (B) zero

(C) positive (D) non-zero

Watch Video Solution

23. Let A by any $m \times n$ matrix then A^2 can be found only when (A) $m < n$

(B) $m = n$ (C) $m > n$ (D) none of these

Watch Video Solution

24. The matrix of the transformation reflection in the line $x+y=0$ is (A) $\begin{bmatrix}-1 & 0 \\ 0 & -1\end{bmatrix}$ (B) $\begin{bmatrix}1 & 0 \\ 0 & -1\end{bmatrix}$ (C) $\begin{bmatrix}0 & 1 \\ 1 & 0\end{bmatrix}$ (D) $\begin{bmatrix}0 & -1 \\ -1 & 0\end{bmatrix}$

Watch Video Solution

25. Rank of a non zero matrix is always (A) 0 (B) 1 (C) >1 (D) >0

Watch Video Solution

26. The values of x for which the matrix $\begin{bmatrix}x+a & b & c \\ a & x+b & c \\ a & b & x+c\end{bmatrix}$ is non-singular are (A) $R-\{0\}$ (B) $R-\{-(a+b+c)\}$ (C) $R-\{0, -(a+b+c)\}$ (D) none of these

Watch Video Solution

27. If $A = \begin{bmatrix} 1 & 1 & 2 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{bmatrix}$ then A is (A) nilpotent (B) idempotent (C) symmetric (D) none of these

Watch Video Solution

28. If $A = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}$ then (A) $A^2 = I$ (B) $A^2 = 0$ (C) $A^3 = 0$ (D) none of these

Watch Video Solution

29. If A and B are square matrices of order 3 then (A) $AB = 0 \to |A| = 0 \text{ or } |B| = 0$ (B) $AB = 0 \to |A| = 0 \text{ and } |B| = 0$ (C) $Adj(AB) = AdjAAdjB$ (D) $(A + B)^{-1} = A^{-1} + B^{-1}$

Watch Video Solution

30. If A a non singular matrix anA^T denotes the transpose of A then (A) $|AA^T| \neq |A^2|$ (B) $|A^T A| \neq |A^T|^2$ (C) $|A| + |A^T| \neq 0$ (D) $|A| \neq |A^T|$

Watch Video Solution

31. If A and B are square matrices of the same order then $(A+B)^2 = A^2 + 2AB + B^2$ implies (A) $AB = 0$ (B) $AB + BA = 0$ (C) $AB = BA$ (D) none of these

Watch Video Solution

32. If $A = \begin{bmatrix} 0 & 2 & -3 \\ -2 & 0 & -1 \\ 3 & 1 & 0 \end{bmatrix}$ then A is (A) diagonal matrix (B) symmetric matix (C) skew symmetric matrix (D) none of these

Watch Video Solution

33. If $A = \begin{bmatrix} 2 & -4 \\ 1 & -1 \end{bmatrix}$ the value of A^n is (A) $\begin{bmatrix} 3^n & (-4)^n \\ 1 & (-1)^n \end{bmatrix}$ (B) $\begin{bmatrix} 3n & -4n \\ n & n \end{bmatrix}$ (C) $\begin{bmatrix} 2+n & 5-n \\ n & -n \end{bmatrix}$ (D) none of these

Watch Video Solution

34. For a non singular matrix A of order n the rank of A is (A) less than n (B) equal to n (C) greater than n (D) none of these

Watch Video Solution

35. Inverse of diagonal matrix is (A) a diagonal matrix (B) symmetric (C) skew symmetric (D) none of these

Watch Video Solution

36. IF A=$\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ then for all natural numbers n A^n is equal to (A) $\begin{bmatrix} 1 & 0 \\ 1 & n \end{bmatrix}$ (B) $\begin{bmatrix} n & 0 \\ 1 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 0 \\ n & 1 \end{bmatrix}$ (D) none of these

Watch Video Solution

37. Prove that the product of the matrices $\begin{bmatrix} \cos^2\alpha & \cos\alpha\sin\alpha \\ \cos\alpha\sin\alpha & \sin^2\alpha \end{bmatrix}$ and $\begin{bmatrix} \cos^2\beta & \cos\beta\sin\beta \\ \cos\beta\sin\beta & \sin^{\beta} \end{bmatrix}$ is the null matrix when α and β differ by an odd multiple of $\frac{\pi}{2}$.

Watch Video Solution

38. For an invertible square matrix of order 3 with real entries $A^{-1} = A^2$ then det A= (A) 1/3 (B) 3 (C) 0 (D) 1

Watch Video Solution

39. If $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} A \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then a is equal to (A) $\begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$

Watch Video Solution

40. The roots of the equation det $\begin{bmatrix} 1-x & 2 & 3 \\ 0 & 2-x & 0 \\ 0 & 2 & 3-x \end{bmatrix} = 0$ are (A) 1 and 2 (B) 1 and 3 (C) 2 and 3 (D) 1,2, and 3

Watch Video Solution

41. If $A = \begin{bmatrix} 1 & 2 & 0 \\ -1 & 1 & 2 \\ 2 & -1 & 1 \end{bmatrix}$ then det$(Adj(AdjA)) =$ (A) 13 (B) 13^2 (C) 13^4 (D) none of these

Watch Video Solution

42. The transformation due of reflection of (x, y) through the origin is described by the matrix (A) $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 0-1 & 0 \\ 0 & -1 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$

Watch Video Solution

43. If $A=\left[a_{ij}\right]_{m\times n}$ and $B=\left[b_{ij}\right]_{n\times p}$ then $(AB)'$ is equal to (A) BA' (B) $B'A$ (C) $A'B'$ (D) $B'A'$

Watch Video Solution

44. If A is a skew-symmetric matrix and n is odd positive integer, then A^n is a skew-symmetric matrix a symmetric matrix a diagonal matrix none of these

Watch Video Solution

45. If A is a skew-symmetric matrix and n is odd positive integer, then A^n is a skew-symmetric matrix a symmetric matrix a diagonal matrix none of these

Watch Video Solution

46. If A and B are symmetric of the same order, then (A) AB is a symmetric matrix (B) A-B is skew symmetric (C) AB-BA is symmetric matrix (D) AB+BA is a symmetric matrix

Watch Video Solution

47. I $A = [x, y, z], B = \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}$ and $C = [x, y, z]^T, thenABC$ is (A) not defined (B) a 1×1 matrix (C) a 3×3 matrix (D) none of these

Watch Video Solution

48. If for a square matrix $A, A^2 = Athen|A|$ is equal to (A) -3 or 3 (B) -2 or 2 (C) 0 or 1 (D) none of these

Watch Video Solution

49. For a matrix A of rank r (A) rank $(A') < r$ (B) rank $(A') = r$. (C) rank $(A') > r$ (D) none of these

Watch Video Solution

50. If A= $\begin{bmatrix} 1 & 3 & 9 & 27 \\ 3 & 9 & 27 & 1 \\ 9 & 27 & 1 & 3 \\ 27 & 1 & 3 & 9 \end{bmatrix}$ then det A= (A) 0 (B) $-(80^3).27$ (C) $(80^3)27$ (D) 81^3

Watch Video Solution

51. If $A = \begin{bmatrix} ab & b^2 \\ -a^2 & -ab \end{bmatrix}$ then matrix A is (A) scalar (B) involuntary (C) idemponent (D) nilpotent

Watch Video Solution

52. If $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & \cos & \sin x \\ 0 & -\sin x & \cos x \end{bmatrix}$ then $(AdjA)^{-1} =$ (A) $\frac{1}{2}A$ (B) A (C) 2A (D) 4A

Watch Video Solution

53. Each diagonal element of a skew symmetric matrix is (A) zero (B) negative (C) positive (D) non real

Watch Video Solution

54. If A is a non singular square matrix then $|adj.\ A|$ is equal to (A) $|A|$ (B) $|A|^{n-2}$ (C) $|A|^{n-1}$ (D) $|A|^{n}$

Watch Video Solution

55. If $A = \begin{bmatrix} 1 & -\tan\theta \\ \tan\theta & 1 \end{bmatrix}\begin{bmatrix} 1 & \tan\theta \\ -\tan\theta & 1 \end{bmatrix}^{-1}$ = $\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$ then (A) $a = b = -1$ (B) $a = \sin 2\theta, b = \cos 2\theta$ (C) $a = \cos 2\theta, b = \sin 2\theta$ (D) none of these

Watch Video Solution

56. If $A = \begin{bmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{bmatrix}$ and $A.(adjA) = k\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then the value of k is

Watch Video Solution

57. If I_n is the identity matrix of order n then $(I_n)^{-1}$ (A) does not exist (B) $= 0$ (C) $= I_n$ (D) $= nI_n$

Watch Video Solution

58. The number of all possible matrices of order $3 \times 3$with each entry 0 or 1 is:(a) 27 (b) 18 (c) 81 (d) 512

Watch Video Solution

59. The number of all the possible matrices of order 2×2 with each entry 0,1 or 2 si (A) 12 (B) 64 (C) 81 (D) none of these

Watch Video Solution

60. If A is an invertible matrix then $\det\left(A^{-1}\right)$ is equal to (A) 1 (B) $\frac{1}{|A|}$ (C) $|A|$ (D) none of these

Watch Video Solution

61. If A and B are two invertible matrices of same order, the $(AB)^{-1}$ is (A) AB (B) BA (C) $B^{-1}A^{-1}$ (D) does not exist

Watch Video Solution

62. If A dn B be 3×3 matrices the AB=0 implies (A) $A = 0 \text{ or } B = 0$ (B) $A = 0 \text{ and } B = 0$ (C) $|A| = 0 \text{ or } |B| = 0$ (D) $|A| = 0 \text{ and } |B| = 0$

Watch Video Solution

63. If A and B are two matrices such that $AB = B \text{ and } BA = A$ then $A^2 + B^2 =$ (A) 2AB (B) 2BA (C) A+B (D) AB

Watch Video Solution

64. If A is a square matrix which of the following is not as symmetrixc matrix? (A) $A - A'$ (B) $A + A'$ (C) AA' (D) $A + B$

Watch Video Solution

65. If A is invertible then which of the following is not true? (A) $A^{-1} = |A|^{-1}$ (B) $(A')^{-1} = (A^{-1})'$ (C) $(A^2)^{-1} = (A^{-1})^2$ (D) none of these

Watch Video Solution

66. If $A = [a_{ij}]_{m \times n}$ is a matrix of rank r then (A) $r < \min\{m, n\}$ (B) $r \leq \min\{m, n\}$ (C) $r = \min\{m, n\}$ (D) none of these

Watch Video Solution

67. If A and B are symmetric matrices, then ABA is

Watch Video Solution

68. $\cos\theta \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix} + \sin\theta \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$ is equal to (A) $\begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Watch Video Solution

69. Consider the set A of all determinants of order 3 with entries 0 or 1 only. Let B be the subset of A consisting of all determinants with value 1. Let C be the subset of the set of all determinants with value -1. Then

Watch Video Solution

70. If A is an $m \times n$ matrix such that AB and BA are both defined, then B is (A) $m \times n$ matrix (B) $n \times n$ matrix (C) $m \times n$ matrix (D) $n \times m$ matrix

Watch Video Solution

71. If A is a skew-symmetric matrix of odd order n, then $|A| = 0$

Watch Video Solution

72. If $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ then A^4 is (A) $\begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Watch Video Solution

73. If $A = \begin{bmatrix} \alpha & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$ and a,b,c are non zero real numbers, then A^{-1} is (A) $\frac{1}{abc}\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (B) $\frac{1}{abc}\begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & c & 0 \end{bmatrix}$ (C) $\frac{1}{abc}\begin{bmatrix} a^{-1} & 0 & 0 \\ 0 & b^{-1} & 0 \\ 0 & c^{-1} & 1 \end{bmatrix}$ (D) $\begin{bmatrix} a^{-1} & 0 & 0 \\ 0 & b^{-1} & 0 \\ 0 & c^{-1} & 1 \end{bmatrix}$

Watch Video Solution

74. The trnsformation orthogonal projection on X-axis is given by the matrix (A) $\begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix}$

Watch Video Solution

75. If $A = \begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$ and $n \varepsilon N$ then A^n is equal to (A) $2^{n-1}A$ (B) $2^n A$ (C) nA (D) none of these

Watch Video Solution

76. If $A = \begin{bmatrix} 1 & 0 \\ \frac{1}{2} & 1 \end{bmatrix}$ then A^{50} is (A) $\begin{bmatrix} 1 & 25 \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 \\ 25 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 0 \\ 0 & 50 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 \\ 50 & 1 \end{bmatrix}$

Watch Video Solution

77. If $\begin{bmatrix} a & b \\ c & -a \end{bmatrix}$ is a square root of the 2×2 identity matrix then a,b,c satisfy the relation (A) $1 - a^2 - bc = 0$ (B) $1 - a^2 + bc = 0$ (C) $1 + a^2 - bc = 0$ (D) $1 + a^2 + bc = 0$

Watch Video Solution

78. Find the following system of equations is consistent, $(a+1)^3x + (a+2)^3y = (a+3)^3$ $(a+1)x + (a+2)y = a+3$ +=1, then find the value of a.

Watch Video Solution

79. Let $A = [a_{ij}]_{n \times n}$ be a square matrix and let c_{ij} be cofactor of a_{ij} in A. If $C = [c_{ij}]$, then

Watch Video Solution

80. If $F(\alpha) = \begin{bmatrix} \cos\alpha & -\sin\alpha & 0 \\ \sin\alpha & \cos\alpha & 0 \\ 0 & 0 & 1 \end{bmatrix}$ and $G(\beta) = \begin{bmatrix} \cos\beta & 0 & \sin\beta \\ 0 & 1 & 0 \\ -\sin\beta & 0 & \cos\beta \end{bmatrix}$, $then[F($ is equal to (A) $F(-\alpha)G(-\beta)$ (B) $G(-\beta)F(-\alpha 0$ (C) $F(\alpha^{-1})G(\beta^{-1})$ (D) $G(\beta^{-1})F(\alpha^{-1})$

Watch Video Solution

81. If A is a square matrix of order $n \times n$ and λ is a scalar then $|\lambda A|$ is (A) $\lambda |A|$ (B) $\lambda^n |A|$ (C) $|\lambda||A|$ (D) none of these

Watch Video Solution

82. If neither α nor β is a multiple of $\frac{\pi}{2}$ and the product AB of matrices $A = \begin{bmatrix} \cos^2 \alpha & \cos \alpha \sin \alpha \\ \cos \alpha \sin \alpha & \sin^2 \alpha \end{bmatrix}$ and $B = \begin{bmatrix} \cos^2 \beta & \cos \beta \sin \beta \\ \cos \beta \sin \beta & \sin^2 \beta \end{bmatrix}$ is a null matrix then $\alpha - \beta$ is (A) 0 (B) an odd mutiple of $\frac{\pi}{2}$ (C) a multiple of π (D) none of these

Watch Video Solution

83. If A and B are two matrices such that AB=A, BA=B, then A^{25} is equal to (A) A^{-1} (B) A (C) $B^{-1}(D)$B`

Watch Video Solution

84. If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ then $\lim_{n \to \infty} \frac{1}{n} A^n$ is (A) an identity matrix (B) $\begin{bmatrix} 0 & 10 \\ -1 & 0 \end{bmatrix}$ (C) a null matrix (D) none of these

Watch Video Solution

85. If $A = \begin{bmatrix} a & b & c \\ x & y & z \\ p & q & r \end{bmatrix}$ and $B = \begin{bmatrix} q & -b & y \\ -p & a & -x \\ r & -c & z \end{bmatrix}$ then (A) $|A| = |B|$ (B) $|A| = -|B|$ (C) $|A| = 2|B|$ (D) none of these

Watch Video Solution

86. The number of different mastrices which can be formed using 12 different real numbers is (A) $6(12)!$ (B) $3(12)!$ (C) $2(10)!$ (D) $4(10)!|$

Watch Video Solution

87. Which of the following is a non singular matrix? (A) $\begin{bmatrix} 1 & a & b+c \\ 1 & b & c+a \\ 1 & c & a+b \end{bmatrix}$

(B) $\begin{bmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{bmatrix}$ where omega is non real and $\omega^2 = 1$ (C) $\begin{bmatrix} 1^2 & 2^2 & 3^2 \\ 2^2 & 3^2 & 4^2 \\ 3^2 & 4^2 & 5^2 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 2 & -3 \\ -2 & 0 & 5 \\ 3 & -5 & 0 \end{bmatrix}$

Watch Video Solution

88. If A and B are two $n \times n$ matrices such that $|A| = |B|$ then (A) $A' = A$ (B) $A = B$ (C) $A' = B'$ (D) none of these

Watch Video Solution

89. If $A = [a_{ij}]$ is a scalar matrix, then trace of A is

Watch Video Solution

90. If for a matrix $A, A^2 + I = 0, where I$ is an identity matrix then A equals (A) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 2 \\ -1 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} -i & 0 \\ 0 & -i \end{bmatrix}$

Watch Video Solution

91. The system of linear equations $ax + by = 0, cx + dy = 0$ has a non trivial solution if (A) $ad + bc = 0$ (B) $ad - bc = 0$ (C) $ad - bc, 0$ (D) $ad - bc.0$

Watch Video Solution

92. The equation $2x + y + z = 0, x + y + z = 1, 4x + 3y + 3z = 2$ have (A) no solution (B) only one solution (C) infinitely many solutions (D) none of these

Watch Video Solution

93. The value of a for which the system of linear equations $ax + y + z = 0, ay + z = 0, x + y + z = 0$ possesses non-trivial solution is

Watch Video Solution

94. The system of equations $3x + y - z = 0, 5x + 2y - 3z = 0, 15x + 6y - 9z = 5$ has (A) no solution (B) a unique solution (C) two distinct solutions (D) infinitely many solutions

Watch Video Solution

95. $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$, then adjoint of A is equal to (A) $\begin{bmatrix} 1 & -2 \\ -2 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 2 & 1 \\ 2 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & -2 \\ -2 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} -1 & 2 \\ 2 & -1 \end{bmatrix}$

Watch Video Solution

96. If $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, J = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$, then B=

(A) $I\cos\theta + J\sin\theta$ (B) $I\cos\theta - J\sin\theta$ (C) $I\sin\theta + J\cos\theta$ (D) $-I\cos\theta + J\sin\theta$

Watch Video Solution

97. If $A = [(1, 0, 0), (0, 1, 0), (1, b, -10]$ then A^2 is equal is (A) unit matrix (B) null matrix (C) A (D) $-A$

Watch Video Solution

98. If A and B are two matrices such that $A + B$ and AB are both defined then (A) A and B can be any matrices (B) A,B are squre matrices not necessarily of same order (C) A,B are square matrices of same order (D) nuber of columns of A=number of rows of B

Watch Video Solution

99. If A and B are symmetric matrices of order $n(A \neq B)$ then (A) A+B is skew symmetric (B) A+B is symmetric (C) A+B is a diagonal matrix (D) A+B is a zero matrix

Watch Video Solution

100. The number of solution of $2x + y = 4, x - 2y = 2, 3x + 5y = 6$ is (A) zero (B) one (C) two (D) infinitely many

Watch Video Solution

101. If $A = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}, B = \begin{bmatrix} -5 & 4 & 0 \\ 0 & 2 & -1 \\ 1 & -3 & 2 \end{bmatrix}$ then (A) $AB = \begin{bmatrix} -2 \\ -1 \\ 4 \end{bmatrix}$ (B) $AB = [-2, -1, 4]$ (C) $AB = [4, -1, 2]$ (D) $AB = \begin{bmatrix} -5 & 4 & 0 \\ 0 & 4 & -2 \\ 3 & -9 & 6 \end{bmatrix}$

Watch Video Solution

102. If A and B are any 2×2 matrices then $\det(A+B)=0$ implies (A) $\det A + \det B = 0$ (B) $\det A = 0$ or $\det B = 0$ (C) $AB = 0 \rightarrow |A| = 0$ and $|B| = 0$ (D) $AB = 0 \rightarrow A = 0$ or $B = 0$

Watch Video Solution

103. From the matrix equation $AB = AC$ we can conclude that $B = C$ provide (A) A is singular (B) A is non singular (C) A is symmetric (D) A is square

Watch Video Solution

104. If each element of a 3×3 matrix A is multiplied by 3 then the determinant of the newly formed matrix is (A) $3 \det A$ (B) $9 \det A$ (C) $(\det A)^3$ (D) $27 \det A$

Watch Video Solution

105. If A and Bare two non-zero square matrices of the same order, such that AB=0, then (a) at least one of A and B is singular (b) both A and B are singular (c) both A and B are non-singular (a) none of these

Watch Video Solution

106. If A and B are two matrices such that $AB = B$ and $BA = A$ then $A^2 + B^2 =$ (A) 2AB (B) 2BA (C) A+B (D) AB

Watch Video Solution

107. The system of linear equations

$x + y + z = 2$

$2x + y - z = 3$

$3x + 2y + kz = 4$ has a unique solution if

Watch Video Solution

108. If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then A^4= (A) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 1 \\ 0 & 10 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

Watch Video Solution

109. The order of $[x, y, z], \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}, \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ is

(A) 3×1

(B) 1×1

(C) 1×3

(D) 3×3

Watch Video Solution

110. $\begin{bmatrix} 1 & 3 \\ 3 & 10 \end{bmatrix}^{-1} =$ (A) $\begin{bmatrix} 10 & 3 \\ 3 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 10 & -3 \\ -3 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 3 \\ 3 & 10 \end{bmatrix}$ (D) $\begin{bmatrix} -1 & -3 \\ -3 & -10 \end{bmatrix}$

Watch Video Solution

111. If $A+B=\begin{bmatrix}1 & 0\\ 1 & 1\end{bmatrix}$ and $A-2B=\begin{bmatrix}-1 & 1\\ 0 & -1\end{bmatrix}$ then A= (A) $\frac{1}{3}\begin{bmatrix}1 & 1\\ 2 & 1\end{bmatrix}$ (B) $\frac{1}{3}\begin{bmatrix}2 & 1\\ 1 & 2\end{bmatrix}$ (C) $\begin{bmatrix}1 & 1\\ 2 & 1\end{bmatrix}$ (D) none of these

Watch Video Solution

112. If $A=\begin{bmatrix}3 & 1\\ -1 & 2\end{bmatrix}$ then $A^2=$ (A) $\begin{bmatrix}8 & -5\\ -5 & 3\end{bmatrix}$ (B) $\begin{bmatrix}8 & -5\\ 5 & 3\end{bmatrix}$ (C) $\begin{bmatrix}8 & -5\\ -5 & -3\end{bmatrix}$ (D) $\begin{bmatrix}8 & 5\\ -5 & 3\end{bmatrix}$

Watch Video Solution

113. The inverse of the matrix $\begin{bmatrix}2 & 3\\ -4 & 7\end{bmatrix}$ is (A) $\begin{bmatrix}-2 & -3\\ 4 & -7\end{bmatrix}$ (B) $\frac{1}{26}\begin{bmatrix}7 & -3\\ 4 & 2\end{bmatrix}$ (C) $\begin{bmatrix}7 & 4\\ -3 & 2\end{bmatrix}$ (D) $\begin{bmatrix}7 & -3\\ 4 & 2\end{bmatrix}$

Watch Video Solution

114. the order of the single matrix obtained from $\begin{bmatrix}1 & -1 \\ 0 & 2 \\ 2 & 3\end{bmatrix}\left\{\begin{bmatrix}-1 & 0 & 2 \\ 2 & 0 & 1\end{bmatrix}-\begin{bmatrix}0 & 1 & 23 \\ 1 & 0 & 21\end{bmatrix}\right\}$ is (A) 2×3 (B) 2×2 (C) 3×2 (D) 3×3

Watch Video Solution

115. The inverse of the matrix $\begin{bmatrix}1 & 0 & 0 \\ a & 1 & 0 \\ b & c & 1\end{bmatrix}$ is (A) $\begin{bmatrix}1 & 0 & 0 \\ -a & 1 & 0 \\ b & c & 1\end{bmatrix}$ (B) $\begin{bmatrix}1 & 0 & 0 \\ -a & 1 & 0 \\ ac & b & 1\end{bmatrix}$ (C) $\begin{bmatrix}1 & -a & ac-b \\ -0 & 1 & -c \\ 0 & 0 & 1\end{bmatrix}$ (D) $\begin{bmatrix}1 & 0 & 0 \\ -a & 1 & 0 \\ ac-b & -c & 1\end{bmatrix}$

Watch Video Solution

116. If the matrix A is both symmetric and skew symmetric, then (A) A is a diagonal matrix (B) A is a zero matrix (C) A is a square matrix (D) None of these

Watch Video Solution

117. If A is a non singular matrix of order 3 then $|adj(adjA)|$ equals (A) $|A|^4$ (B) $|A|^6$ (C) $|A|^3$ (D) none of these

Watch Video Solution

118. If $A=\begin{bmatrix}4 & -5 & -2\\ 5 & -4 & 2\\ 2 & 2 & 8\end{bmatrix}, thenA(adjA)$ equals (A) $\begin{bmatrix}36 & -36 & 18\\ 36 & 36 & -18\\ 18 & -18 & 9\end{bmatrix}$ (B) $\begin{bmatrix}-36 & 36 & 18\\ -36 & 36 & -18\\ -18 & 18 & 9\end{bmatrix}$ (C) $\begin{bmatrix}0 & 0 & 0\\ 0 & 0 & 0\\ 0 & -0 & 0\end{bmatrix}$ (D) none of these

Watch Video Solution

119. If $A=\begin{bmatrix}1 & 2\\ 4 & 1\end{bmatrix}, thenA^{-1}=$ (A) $\begin{bmatrix}-1 & -2\\ 4 & 1\end{bmatrix}$ (B) $\frac{1}{7}\begin{bmatrix}1 & 2\\ -4 & -1\end{bmatrix}$ (C) $\frac{1}{7}\begin{bmatrix}-1 & -2\\ 4 & 1\end{bmatrix}$ (D) $\frac{1}{9}\begin{bmatrix}1 & 2\\ 4 & 1\end{bmatrix}$

Watch Video Solution

120. Value of $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix}$ is (A) $(a-b)(b-c)(c-a)$ (B) $\left(a^2-b^2\right)\left(b^2-c^2\right)\left(c^2-a^2\right)$ (C) $(a-b+c)(b-c+a)(c+a-b)$ (D) none of these

Watch Video Solution

121. $\begin{bmatrix} 7 & 1 & 2 \\ 9 & 2 & 1 \end{bmatrix}\begin{bmatrix} 3 \\ 3 \\ 5 \end{bmatrix}+2\begin{bmatrix} 4 \\ 2 \end{bmatrix}=$ (A) $\begin{bmatrix} 43 \\ 44 \end{bmatrix}$ (B) $\begin{bmatrix} 43 \\ 45 \end{bmatrix}$ (C) $\begin{bmatrix} 45 \\ 44 \end{bmatrix}$ (D) none of these

Watch Video Solution

122. Multiple inverse of the matrix $\begin{bmatrix} 2 & 1 \\ 7 & 4 \end{bmatrix}$ is (A) $\begin{bmatrix} 4 & -1 \\ 7 & -2 \end{bmatrix}$ (B) $\begin{bmatrix} -4 & -1 \\ 7 & -2 \end{bmatrix}$ (C) $\begin{bmatrix} 4 & -1 \\ 7 & 2 \end{bmatrix}$ (D) $\begin{bmatrix} 4 & -1 \\ -7 & -2 \end{bmatrix}$

Watch Video Solution

123. If $f(x) = x^2 + 4x - 5$ and $A = \begin{bmatrix} 1 & 2 \\ 4 & -3 \end{bmatrix} then f(A) =$ (A) $\begin{bmatrix} 0 & -4 \\ 8 & 8 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & -4 \\ 8 & 8 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$ (D) $\begin{bmatrix} 8 & 4 \\ 8 & 0 \end{bmatrix}$

Watch Video Solution

124. The inverse of the matrix $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ is (A) $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 0 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} \frac{1}{2} & 0 & 0 \\ 0 & \frac{1}{2} & 0 \\ 0 & 0 & \frac{1}{2} \end{bmatrix}$

Watch Video Solution

125. If $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & a & 1 \end{bmatrix} A^{-1} = \begin{bmatrix} \frac{1}{2} & \frac{-1}{2} & \frac{1}{2} \\ -4 & 3 & c \\ \frac{5}{2} & \frac{-3}{2} & \frac{1}{2} \end{bmatrix}$, then

Watch Video Solution

126. If $A = \begin{bmatrix} 0 & -1 & 2 \\ 1 & 0 & 3 \\ -2 & -3 & 0 \end{bmatrix}, then A + 2A^t$ equals (A) a (B) $-A^t$ (C) A^t (D) $2A^2$

Watch Video Solution

127. The adjoint of the matrix $\begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}$ is (A) $\begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & -5 \\ -3 & 2 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & -3 \\ -5 & 2 \end{bmatrix}$ (D) $\begin{bmatrix} -1 & 3 \\ 5 & -2 \end{bmatrix}$

Watch Video Solution

128. If A is a square matrix then $A - A'$ is a

A. diagonal matrix

B. skew symmetric matrix

C. symmetric matrix

D. none of these

Answer: A

Watch Video Solution

129. If $A = \begin{bmatrix} 2 & 3 \\ 5 & -2 \end{bmatrix}$ then $9A^{-1}$ is equal to (A) A' (B) 2A (C) $\frac{1}{2}A$ (D) A

Watch Video Solution

130. The matrix X in the equation $AX = B$, such that $A = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$ is given by (A) $\begin{bmatrix} 1 & 0 \\ -3 & 1 \end{bmatrix}$ (B) $[(1, -4), 0, 1)]$ (C) $\begin{bmatrix} 1 & -3 \\ 0 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 0 & -1 \\ -3 & 1 \end{bmatrix}$

Watch Video Solution

131. If $\begin{bmatrix} 1 & a & 2 \\ 1 & 2 & 5 \\ 2 & 1 & 1 \end{bmatrix}$ is non invertible then a= (A) 2 (B) 1 (C) 0 (D) -1

Watch Video Solution

132. If $A=\begin{bmatrix}-a^2 & ab & ac\\ ab & -b^2 & bc\\ ac & bc & -c^2\end{bmatrix}$ then det A is equal to (A) $4abc$ (B) $4a^2b^2c^2$ (C) $-4abc$ (D) $-4a^2b^2c^2$

Watch Video Solution

133. If $A=\begin{bmatrix}1 & \tan\left(\frac{\theta}{2}\right)\\ -\tan\left(\frac{\theta}{2}\right) & 1\end{bmatrix}$ and $AB=I, thenB=$ (A) $\left\{\cos^2\left(\frac{\theta}{2}\right)\right\}A$ (B) $\left\{\cos^2\left(\frac{\theta}{2}\right)\right\}A'$ (C) $\left\{\cos^2\left(\frac{\theta}{2}\right)\right\}I$ (D) none of these

Watch Video Solution

134. If $A=\begin{bmatrix}-1 & 0 & 0 & 1\\ -1 & 1 & 0 & 2\\ -1 & 0 & 0 & 1\\ 0 & 0 & 0 & 0\end{bmatrix}, thenA(adjA)$ equals (A) $\begin{bmatrix}1 & 5 & 0 & 2\\ 5 & 1 & 7 & 1\\ -1 & 0 & 1 & 0\\ 0 & 0 & 5 & 0\end{bmatrix}$

(B) zero matrix (C) a scalar quantity (D) identity matrix

Watch Video Solution

135. I $A=\begin{bmatrix}0&5\\0&0\end{bmatrix}$ and $f(x)=1+x+x^2+\ldots+^{16}$, $thenf(A)=$ (A) 0 (B) $\begin{bmatrix}1&5\\0&1\end{bmatrix}$ (C) $\begin{bmatrix}1&5\\0&0\end{bmatrix}$ (D) $\begin{bmatrix}0&5\\1&1\end{bmatrix}$

Watch Video Solution

136. If A is a non singular square matrix 3 then $\left|adj\left(A^3\right)\right|$ equals (A) $|A|^8$ (B) $|A|^6$ (C) $|A|^9$ (D) $|A|^{12}$

Watch Video Solution

137. If A is a square matrix of order $n\times n$ and k is a scalar, then $adj(kA)$ is equal to (1) $kadjA$ (2) k^nadjA (3) $k^{n-1}adjA$ (4) $k^{n+1}adjA$

Watch Video Solution

138. If $A=\begin{bmatrix}3&-3&4\\2&-3&4\\0&-1&1\end{bmatrix}$ 2-3 41 then show that $A^{-1}=A^1$.

Watch Video Solution

139. If $A = [(1, 0,), (2, 0)]$ and $B = \begin{bmatrix} 0 & 0 \\ 1 & 12 \end{bmatrix}$ then= (A) $AB = 0, BA = 0$ (B) $AB = 0, BA \neq 0$ (C) $AB \neq 0, BA = 0$ (D) $AB \neq 0, BA \neq)$

Watch Video Solution

140. The value of a for which system of equation , $a^3x + (a+1)^3y + (a+2)^3z = 0, ax + (a+1)y + (a+2)z = 0, x + y +$

has a non-zero solution is:

Watch Video Solution

141. If I_3 is the identity matrix of order 3 then I_3^{-1} is (A) 0 (B) $3I_3$ (C) I_3 (D) does not exist

Watch Video Solution

142. If the matrix AB=0 then (A) $A = 0$ or $B = 0$ (B) $A = 0$ and $B = 0$ (C) It is not necessary that either A=0 or B=0 (D) $A \neq 0, B \neq 0$

Watch Video Solution

143. The matrix $[05 - 7 - 50117 - 110]$ is (a) a skew-symmetric matrix (b) a symmetric matrix (c) a diagonal matrix (d) an upper triangular matrix

Watch Video Solution

144. A square matrix $A = [a_{ij}]$ in which $a_{ij} = 0$ for $i \neq j$ and $[a]_{ij} = k$ (constant) for i=j is called a (A) unit matrix (B) scalar matrix (C) null matrix (D) diagonal matrix

Watch Video Solution

145. If $A=\begin{bmatrix}2&2\\-3&2\end{bmatrix}$ and $B=\begin{bmatrix}0&-1\\1&0\end{bmatrix}then\left(B^{-1}A^{-1}\right)^{-1}=$ (A) $\begin{bmatrix}2&-2\\2&3\end{bmatrix}$ (B) $\begin{bmatrix}3&-2\\2&3\end{bmatrix}$ (C) $\frac{1}{10}\begin{bmatrix}2&2\\-2&3\end{bmatrix}$ (D) $\frac{1}{10}\begin{bmatrix}3&-2\\-2&2\end{bmatrix}$

Watch Video Solution

146. If $A=[023-4]$ and $kA=[03a2b24]$, then the values of $k,\ a,\ b$, are respectively (a) -6, -12, -18 (b) -6, 4, 9 (c) -6, -4, -9 (d) -6, 12, 18

Watch Video Solution

147. If $A=\begin{bmatrix}1&2\\0&1\end{bmatrix}, thenA^n=$ (A) $\begin{bmatrix}1&2n\\0&1\end{bmatrix}$ (B) $\begin{bmatrix}2&n\\0&1\end{bmatrix}$ (C) $\begin{bmatrix}1&2n\\0&-1\end{bmatrix}$ (D) $\begin{bmatrix}1&n\\0&1\end{bmatrix}$

Watch Video Solution

148. For the matrix $A = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 2 & 1 \\ 2 & 1 & 0 \end{bmatrix}$ which of the following is correct? (A) $A^3 + 3A^2 - I = 0$ (B) $A^3 - 3A^2 - I = 0$ (C) $A^3 + 2A^2 - I = 0$ (D) $A^3 - + A^2 - + I = 0$

Watch Video Solution

149. If $A^2 - A + I = 0$, then the inverse of A is: (A) $A + I$ (B) A (C) $A - I$ (D) $I - A$

Watch Video Solution

150. If $\begin{bmatrix} 2+x & 3 & 4 \\ 1 & -1 & 2 \\ x & 1 & -5 \end{bmatrix}$ is a singular matrix then x is (A) $\frac{13}{25}$ (B) $-\frac{25}{13}$ (C) $\frac{5}{13}$ (D) $\frac{25}{13}$

Watch Video Solution

151. If $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ a & b & -1 \end{bmatrix}$ then A^2 is equal to (A) null matrix (B) unit matrix (C) $-A$ (D) A

Watch Video Solution

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

A. $\begin{bmatrix} -5 & -2 \\ -3 & 1 \end{bmatrix}$

B. $\begin{bmatrix} \frac{5}{11} & \frac{2}{11} \\ \frac{3}{11} & -\frac{1}{11} \end{bmatrix}$

C. $\begin{bmatrix} -\frac{5}{11} & -\frac{2}{11} \\ -\frac{3}{11} & -\frac{1}{11} \end{bmatrix}$

D. $\begin{bmatrix} 5 & 2 \\ 3 & -1 \end{bmatrix}$

Watch Video Solution

153. If A and B are two square matrices of the same order then $(A-B)^2$ is (A) $A^2 - AB - BA + B^2$ (B) $A^2 - 2AB + B^2$ (C) $A^2 - 2BA + B^2$ (D) $A^2 - B^2$

Watch Video Solution

154. If $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$ and i is the unit matrix of order 2, then A^2 is equal to (A) $4A - 3I$ (B) $3A - 4I$ (C) $A - I$ (D) $A + I$

Watch Video Solution

155. If $P = \begin{bmatrix} i & 0 & -i \\ 0 & -i & i \\ -i & i & 0 \end{bmatrix}$ and $Q = \begin{bmatrix} -i & i \\ 0 & 0 \\ i & -i \end{bmatrix}$ then PQ is equal to (A) $\begin{bmatrix} -2 & 2 \\ 1 & -1 \\ 1 & -1 \end{bmatrix}$ (B) $\begin{bmatrix} 2 & -2 \\ -1 & -1 \\ -1 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 2 & 2 \\ -1 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Watch Video Solution

156. Let R be a square matrix of order greater than 1 such that R is lower triangular.Further suppose that none of the diagonal elements of the square matrix R vanishes. Then (A) R must be non singular (B) R^{-1} does not exist (C) R^{-1} is an upper triangular matrix (D) R^{-1} is a lower triangular matrix

Watch Video Solution

157. If A^{-1} = $\begin{bmatrix} 1 & -1 & 0 \\ 0 & -2 & 1 \\ 0 & 0 & 1 \end{bmatrix}$ then (A) A is non-singular (B) A is skew symmetric (C) $|A| = 2$ (D) $AdjA = \begin{bmatrix} \frac{1}{2} & -\frac{1}{2} & 0 \\ 0 & -1 & \frac{1}{2} \\ 0 & 0 & -\frac{1}{2} \end{bmatrix}$

Watch Video Solution

158. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then (A) $A^{-1} = \frac{1}{5}(A - 4I_3)$ (B) $A^2 - 4A - 5I_3 = 0$ (C) A^2 is invertible (D) A^3 is non invertible

Watch Video Solution

159. Which of the following is a triangular matrix? (A) a scalar matrix (B) a lower triangular matrix (C) an upper triangular matrix (D) a diagonal matrix

Watch Video Solution

160. If A and B are square matrices of the same order such that AB=BA, then (A) $(A-B)(A+B)=A^2-B^2$ (B) $(A+B)^2=A^2+2AB+B^2$ (C) $(A+B)^3=A^3A^2B+3AB^2+B^3$ (D) $(AB)^2=A^2B^2$

Watch Video Solution

161. The homogeneous system AX=) of n linear equation in n variables has (A) a unique solutions if $|A|\neq 0$ (B) infinitely many solution if $|A|=0$ (C) no solution (D) none of these

Watch Video Solution

162. The homogeneous system AX=0of n linear equation in n variables has (A) a unique solutions if $|A| \neq 0$ (B) infinitely many solution if $|A| = 0$ (C) no solution (D) none of these

Watch Video Solution

163. Let A,B,C be 2×2 matrices with entries from the set of real numbers. Define operations $\cdot$ as follows $A \cdot B = \frac{1}{2}(AB + BA)$ then (A) $A \cdot I = A$ (B) $A \cdot A = A^2$ (C) $A \cdot B = B \cdot A$ (D) $A \cdot (B + C) = A \cdot B + A \cdot C$

A. $A \cdot B = B \cdot A$

B. $A \cdot A = A^2$

C. $A \cdot (B + C) = A \cdot B + A \cdot C$

D. $A \cdot I = A$

Answer: A , B , C , D

Watch Video Solution

164. If $A = \begin{bmatrix} 0 & \sin\alpha & \sin\alpha\sin\beta \\ -\sin\alpha & 0 & \cos\alpha\cos\beta \\ -\sin\alpha\sin\beta & -\cos\alpha\cos\beta & 0 \end{bmatrix}$ then (A) $|A|$ is independent of α and β (B) A^{-1} depends only on beta (C) A^{-1} does not exist (D) none of these

Watch Video Solution

165. Let $A = \begin{bmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{bmatrix}, where 0 \leq \theta < 2\pi$ then (A) $|A| = 0$ (B) $|A| \varepsilon [2, 4]$ (C) $|A| \varepsilon)(0, \infty)$ (D) $|A| \varepsilon (2, \infty)$

Watch Video Solution

166. If $A = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ then (A) $A^{-n} = \begin{bmatrix} 1 & 0 \\ -n & 1 \end{bmatrix}, n \varepsilon N$ (B) $\lim_{n \to 00} \frac{1}{n^2} A^{-n} = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$ (C) $\lim_{n \to \infty} \frac{1}{n} A^{-n} = \begin{bmatrix} 0 & 0 \\ -1 & 0 \end{bmatrix}$ (D) none of these

Watch Video Solution

167. If A and B are symmetric matrices of the same order then (A) A-B is skew symmetric (B) A+B is symmetric (C) AB-BA is skew symmetric (D) AB+BA is symmetric

Watch Video Solution

168. If A and B are two matrices such that AB=BA, then for every $n\varepsilon N$ (A) $(AB)^n = A^n B^n$ (B) $A^n B = B A^n$ (C) $\left(A^{2n} - B^{2n}\right) = (A^n - B^n)(A^n + B^n)$ (D) $(A+B)^n = {}^n C_0 A^n + {}^n C_1 A^{n-1} B + {}^n C_n B^n$

Watch Video Solution

169. Which of the following is a symmetric matrix? (A) a null matrix (B) a triangular matrix (C) an idenity matrix (D) a diagonal matrix

Watch Video Solution

170. If A and B are square matrices of the same order then $(A+B)^2 = A^2 + 2AB + B^2$ implies (A) both AB and BA are defined (B) $(AB)^t = B^t A^t$ (C) $(AB)^{-1} = B^{-1} A^{-1}$ if $|A| \neq 0$ (D) $AB = BA$

Watch Video Solution

171. If A is an invertible matrix of order $n \times n, (n \geq 2), then(A)A$ is symmetric (B) $adjA$ is invertible (C) $Adj(AdjA) = |A|^{n-2} A$ (D) none of these

Watch Video Solution

172. If A is an invertible matrix then which of the following are true?

A. $A \neq 0$

B. $|A| \neq 0$

C. $adjA \neq 0$

D. $A^{-1} = |A| adj A$

Answer: (A, B, C)

Watch Video Solution

173. If A and B are invertible matrices of the same order then (A) $Adj(AB) = (adjB)(adjA)$ (B) $(A+B)^{-1} = A^{-1} + B^{-1}$ (C) $(AB)^{-1} = B^{-1}A^{-1}$ (D) none of these

Watch Video Solution

174. The system $x + y + z = 6, x + 2y + 3z = 10, x + 2y + \lambda z = \gamma$ of simultaneous equations has (A) a unique solutions if $\lambda \neq 3$ (B) no solution if $\lambda = 3, \gamma \neq 10$ (C) infinitely many solutions if $\lambda = 3, \gamma = 10$ (D) none of these

Watch Video Solution

175. A square matrix A is said to be orthogonal if $A^T A = I$ If A is a square matrix of order n and k is a scalar, then $|kA| = K^n |A|. Also \left|A^T\right| = |A|$ and for any two square matrix A and B of same order $|AB| = |A||B|$ On the basis of above information answer the following question: If $A = \begin{bmatrix} p & q & r \\ q & r & p \\ r & p & q \end{bmatrix}$ be an orthogonal matrix and $pqr = 1, then p^3 + q^3 + r^3$ may be equal to (A) 2 (B) 1 (C) 3 (D) -1

Watch Video Solution

176. A square matrix A is said to be orthogonal if $A^T A = I$ If A is a square matrix of order n and k is a scalar, then $|kA| = K^n |A| Also \left|A^T\right| = |A|$ and for any two square matrix A d B of same order $AB| = |A \mid |B|$ On the basis of above information answer the following question: IF A is a 3×3 orthogonal matrix such that $|A| = 1, then |A - I| =$ (A) 1 (B) -1 (C) 0 (D) none of these

Watch Video Solution

177. A square matrix A is said to be orthogonal if $A^T A = I$ If A is a sqaure matrix of order n and k is a scalar, then $|kA| = K^n |A| Also \left|A^T\right| = |A|$ and for any two square matrix A d B of same order $AB| = |A| \; |B|$ On the basis of abov einformation answer the following question: If A is an orthogonal matrix then (A) A^T is an orthogonal matrix but A^{-1} is not an orthogonal matrix (B) A^T is not an orthogonal mastrix but A^{-1} is an orthogonal matrix (C) Neither A^T nor A^{-1} is an orthogonal matrix (D) Both A^T and A^{-1} are orthogonal matices.

Watch Video Solution

178. A square matrix A is said to be orthogonal if $A^T A = I$ If A is a sqaure matrix of order n and k is a scalar, then $|kA| = K^n |A| Also \left|A^T\right| = |A|$ and for any two square matrix A d B of same order $AB| = |A| \; |B|$ On the basis of abov einformation answer the following question:If $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ and P is a orthogonal martix and $B = PAP^T, P^T B^{2009} P =$ (A) $\begin{bmatrix} 1 & 2009 \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 2009 \\ 2009 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 0 \\ 2009 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Watch Video Solution

179. If A is a square matrix of any order then $|A-x|=0$ is called the characteristic equation of matrix A and every square matrix satisfies its characteristic equation. For example if $A=\begin{bmatrix}1 & 2\\ 1 & 5\end{bmatrix}$, Then $[(A-xI)], =\begin{bmatrix}1 & 2\\ 1 & 5\end{bmatrix}-\begin{bmatrix}x & 0\\ 0 & x\end{bmatrix}=\begin{bmatrix}1-x & 2\\ 1-0 & 5-u\end{bmatrix}=\begin{bmatrix}1-x & 2\\ 1 & 5-x\end{bmatrix}$

Characteristic equation of matri A is $\begin{vmatrix}1-x & 2\\ 1 & 5-x\end{vmatrix}=0$ or $(1-x)(5-x0-2=0$ or $x^2-6x+3=0.$

Matrix A will satisfy this equation ie. $A^2-6A+3I=0$ then A^{-1} can be determined by multiplying both sides of this equation let $A=\begin{bmatrix}1 & 0 & 0\\ 0 & 1 & 1\\ 1 & -2 & 4\end{bmatrix}$ On the basis fo above information answer the following questions: If $6A^{-1}=A^2+aA+bI, then(a,b)$ is (A) $(-6, 11)$ (B) $(-11, 60$ (C) $(11, 6)$ (D) $(6, 11)$

Watch Video Solution

180. If A is a square matrix of any order then $|A - x| = 0$ is called the chracteristic equation of matrix A and every square matrix satisfies its chatacteristic equation. For example if $A = \begin{bmatrix} 1 & 2 \\ 1 & 5 \end{bmatrix}$, Then $[(A - xI)], = \begin{bmatrix} 1 & 2 \\ 1 & 5 \end{bmatrix} - \begin{bmatrix} x & 0 \\ 0 & x \end{bmatrix} = \begin{bmatrix} 1 - x & 2 \\ 1 - 0 & 5 - x \end{bmatrix} = \begin{bmatrix} 1 - x & 2 \\ 1 & 5 - x \end{bmatrix}$ Characteristic equation of matrix A is $\begin{vmatrix} 1 - x & 2 \\ 1 & 5 - x \end{vmatrix} = 0 \text{ or } (1 - x)(5 - x)(0 - 2) = 0$ or $x^2 - 6x + 3 = 0$ Matrix A will satisfy this equation ie. $A^2 - 6A + 3I = 0$ A^{-1} can be determined by multiplying both sides of this equation let $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 1 & -2 & 4 \end{bmatrix}$ On the basis for above information answer the following questions:Sum of elements of A^{-1} is (A) 2 (B) -2 (C) 6 (D) none of these

Watch Video Solution

181. If A is a square matrix of any order then $|A - x| = 0$ is called the characteristic equation of matrix A and every square matrix satisfies its characteristic equation. For example if $A = \begin{bmatrix} 1 & 2 \\ 1 & 5 \end{bmatrix}$, Then

$[(A-xI)], = \begin{bmatrix} 1 & 2 \\ 1 & 5 \end{bmatrix} - \begin{bmatrix} x & 0 \\ 0 & x \end{bmatrix} = \begin{bmatrix} 1-x & 2 \\ 1-0 & 5-u \end{bmatrix} = \begin{bmatrix} 1-x & 2 \\ 1 & 5-x \end{bmatrix}$

Characteristic equation of matri A is

$\begin{vmatrix} 1-x & 2 \\ 1 & 5-x \end{vmatrix} = 0$ or $(1-x)(5-x0-2=0$ or $x^2-6x+3=0$

Matrix A will satisfy this equation ie. $A^2-6A+3I=0$ A^{-1} can be determined by multiplying both sides of this equation let

$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 1 & -2 & 4 \end{bmatrix}$ ON the basis fo above information answer the following questions:$|A^{-1}| =$ (A) 6 (B) $\frac{1}{6}$ (C) 12 (D) none of these

Watch Video Solution

182. If the matrix $\begin{bmatrix} 1 & 3 & \lambda+2 \\ 2 & 4 & 8 \\ 3 & 5 & 10 \end{bmatrix}$ is singular then find λ

Watch Video Solution

183. If $A = \begin{bmatrix} 1 & 3 \\ 3 & 4 \end{bmatrix}$ and $A^2 - xA - I = 0$ then find x.

Watch Video Solution

184. For a 3×3 matrix A if $|A| = 4$, then find $|AdjA|$

Watch Video Solution

185. Assertion: $|M| = 0$, Reason: Determinant of a skew symmetric matrix is 0. (A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true R is not te correct explanation of A (C) A is true but R is false. (D) A is false but R is true.

Watch Video Solution

186. Assertion: $\left|AA^T\right| = 0$, Reason : A is a skew symmetric matrix (A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true R is not te correct explanation of A (C) A is true but R is false. (D) A is false but R is true.

Watch Video Solution

187. Assertion : A^{-1} exists, Reason: $|A| = 0$ (A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true R is not te correct explanation of A (C) A is true but R is false. (D) A is false but R is true.

Watch Video Solution

188. Assertion: $|AadjA| = -1$, Reason : If A is a non singular square matrix of order n then $|adjA| = |A|^{n-1}$ (A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true R is not te correct explanation of A (C) A is true but R is false. (D) A is false but R is true.

Watch Video Solution

189. Assertion: adj A is a no singular matrix., Reason: A is a no singular matix. (A) Both A and R are true and R is the correct explanation of A (B)

Both A and R are true R is not te correct explanation of A (C) A is true but R is false. (D) A is false but R is true.

Watch Video Solution

190. Assertion: If $\left|A^2\right| = 25$ then $A = \pm\frac{1}{5}$, Reason: $|AB| = |A||B|$ (A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true R is not te correct explanation of A (C) A is true but R is false. (D) A is false but R is true.

Watch Video Solution

191. Statement 1: The system of equations has unique solution for $\lambda = -5$, Reason: The determinant $\begin{vmatrix} 3 & -1 & 4 \\ 1 & 2 & -3 \\ 6 & 5 & \lambda \end{vmatrix} \neq 0f \text{ or } \lambda \neq -5$ (A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true R is not te correct explanation of A (C) A is true but R is false. (D) A is false but R is true.

Watch Video Solution

192. If M is a 3×3 matrix, where det $M = 1 and MM^T = 1, where I$ is an identity matrix, prove theat det $(M - I) = 0$.

Watch Video Solution

193. If $P = \begin{bmatrix} \frac{\sqrt{3}}{2} & \frac{1}{20} \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{bmatrix}, A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ and $Q = PAP^T, then P^T Q^{2005} P$ is:

(A) $\begin{bmatrix} 1 & 2005 \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 2005 \\ 2005 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 0 \\ 2005 & 1 \end{bmatrix}$ (D) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

Watch Video Solution

194. If $A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & -2 & 4 \end{bmatrix}, 6A^{-1} = A^2 + cA + dI,$ then $(c, d) =$

Watch Video Solution

195. Let $A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & 2 & 1 \end{bmatrix}, itU_1, U_2 \text{ and } U_3$ are column matrices satisfying

$AU_1 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, AU_2 = \begin{bmatrix} 2 \\ 3 \\ 0 \end{bmatrix} \text{ and } AU_3 = \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix} \text{ and } Uisa3 \times 3$ matrix when columns are U_1, U_2, U_3 now answer the following question: The value of $|U|$ is (A) 3 (B) -3 (C) $\frac{3}{2}$ (D) 2

Watch Video Solution

196. Let $A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & 2 & 1 \end{bmatrix}, \text{ if } U_1, U_2 \text{ and } U_3$ are column matrices satisfying

$AU_1 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, AU_2 = \begin{bmatrix} 2 \\ 3 \\ 0 \end{bmatrix} \text{ and } AU_3 = \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix} \text{ and } Uisa3 \times 3$ matrix when columns are U_1, U_2, U_3 now answer the following question: The sum of elements of U^{-1} is: (A) -1 (B) 0 (C) 1 (D) 3

Watch Video Solution

197. Let $A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & 2 & 1 \end{bmatrix}, itU_1, U_2 \text{ and } U_3$ are column matrices satisfying $AU_= \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}, AU_2 = \begin{bmatrix} 2 \\ 3 \\ 0 \end{bmatrix} \text{ and } AU_3 = \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix} \text{ and } Uisa3 \times 3$ matrix when columns are U_1, U_2, U_3 now answer the following question:

The value of determinant $\begin{bmatrix} 3 & 2 & 0 \end{bmatrix} I \begin{bmatrix} 3 \\ 2 \\ 0 \end{bmatrix}$ is (A) 5 (B) $\frac{5}{2}$ (C) 4 (D) $\frac{3}{2}$

Watch Video Solution

198. Consider the system of equations $x - 2y + 3z = -1, -x + y - 2z = k, x - 3y + 4z = 1$ Assertion: The system of equations has no solution for $k \neq 3$ and Reason: The determinant $\begin{vmatrix} 1 & 3 & -1 \\ -1 & -2 & k \\ 1 & 4 & 1 \end{vmatrix} \neq 0, f \text{ or } k \neq 3$ (A) Both A and R are true and R is the correct explanation of A (B) Both A and R are true R is not te correct explanation of A (C) A is true but R is false. (D) A is false but R is true.

Watch Video Solution

199. Let A be the set of all 3×3 symmetric matrices all of whose entries are either 0 or 1. Five of these entries are 1 and four of them are 0. The number of matrices in A is

Watch Video Solution

200. Let A be the set of all 3×3 symmetric matrices all of whose entries are either 0 or 1. Five of these entries are 1 and four of them are 0. The number of matrices in A is

Watch Video Solution

201. Let A be the set of all 3×3 symmetric matrices all of whose entries are either 0 or 1. Five of these entries are 1 and four of them are 0. The number of matrices in A is

Watch Video Solution