MATHS

BOOKS - PRADEEP PUBLICATION

MATRICES

Example

1. If A is a matrix of order $m \times n$ and R is a row of A, find order of R as a matrix.

Watch Video Solution

2. If A is a column matrix with 9 rows, find the order of a row R of A.

Watch Video Solution

3. If a matrix has 8 elements, what are the possible orders it can have? What , if it has 5 elements?

Watch Video Solution

4. Consider the matrices $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 5 & 0 & 7 \\ 0 & -1 & 8 & 1 \end{bmatrix}$ Find the sum of A and B.

Watch Video Solution

5. Give an examples of a matrix which is a row as well as a column matrix.

Watch Video Solution

6. Give an examples of a matrix which is a lower triangular as well as an upper triangular matrix.

Watch Video Solution

7. Give an examples of a matrix which is a square matrix of order 3, which is not a diagonal matrix.

Watch Video Solution

8. Construct a 2×3 matrix $A = [a_{ij}]_{2 \times 3}$ for which $a_{ij} = i - j$

Watch Video Solution

9. Construct a 2×3 matrix $A = [a_{ij}]_{2 \times 3}$ for which $a_{ij} = ij$

Watch Video Solution

10. Construct a $2x3$ matrix $A = [a_{ij}]_{2\times 3}$ for which $a_{ij} = 2i + j$

Watch Video Solution

11. Construct a 2×2 matrix A whose elements are given by $a_{ij} = \frac{1}{2}(i - 2j)^2$

Watch Video Solution

12. Construct a 2×2 matrix A whose elements are given by $a_{ij} = \frac{1}{2}|-3i + j|$

Watch Video Solution

13. Construct a 2×2 matrix A whose elements are given by $a_{ij} = e^{2/x} \sin jx.$

Watch Video Solution

14. Construct a matrix $A = \left[a_{ij}\right]_{3 \times 4}$ whose entries are given by $a_{ij} = \frac{I - j}{I + j}$

Watch Video Solution

15. Construct a 3×2 matrix , whose element a_{ij} are given by $a_{ij} = e^{2ix} \sin jx.$

Watch Video Solution

16. Write the element a_{23} of a 3×3 matrix A = $[a_{ij}]$ whose elements a_{ij} are given $a_{ij} = \frac{|i-j|}{2}$

Watch Video Solution

17. Find the values of a, b, c and d from the following equation:

$$\begin{bmatrix} 2a+b & a-2b \\ 5c-d & 4c+3d \end{bmatrix} = \begin{bmatrix} 4 & -3 \\ 11 & 24 \end{bmatrix}.$$

Watch Video Solution

18. Find x, y,z and w if $\begin{bmatrix} xy & w \\ z+6 & x+y \end{bmatrix} = \begin{bmatrix} 8 & 2 \\ 0 & 6 \end{bmatrix}$.

Watch Video Solution

19. Find the values of x and y if X = Y, where $X = \begin{bmatrix} x+10 & y^2+2y \\ 0 & -4 \end{bmatrix}$ and $Y = \begin{bmatrix} 3x+4 & 3 \\ 0 & y^2-5y \end{bmatrix}$.

Watch Video Solution

20. If $\begin{bmatrix} x+3 & z+4 & 2y-7 \\ 4x+6 & a-1 & 0 \\ b-3 & 3b & z+2c \end{bmatrix} = \begin{bmatrix} 0 & 6 & 3y-2 \\ 2x & -3 & 2c+2 \\ 2b+4 & -21 & 0 \end{bmatrix}$, obtain the values of a,b,c and x,y and z.

Watch Video Solution

21. Taking $A = \begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}$ and C $= \begin{bmatrix} 3 & 1 \\ 0 & 2 \end{bmatrix}$, verify that $A + (B + C) = (A + B) + C$

Watch Video Solution

22. If $A = \begin{bmatrix} 1 & -2 & 3 \\ 0 & 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 2 & 5 \\ 6 & -3 & 1 \end{bmatrix}$, verfy that 3 (A+B) = 3A + 3B.

Watch Video Solution

23. Let A $= \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$. Find the followiing :

A+ B

Watch Video Solution

24. Let A $= \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$. Find the followiing :

A - B

Watch Video Solution

25. Let A $= \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$. Find the followiing :

3 A - C

Watch Video Solution

26. Let A $= \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$. Find the followiing :

2A - B - 3 C

Watch Video Solution

27. If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -1 & 3 \\ -1 & 0 & 2 \end{bmatrix}$, then find 2A – B.

Watch Video Solution

28. If

$A = \begin{bmatrix} 1 & 3 & 4 \\ 2 & 0 & 1 \\ -3 & 2 & 3 \end{bmatrix}, B = \begin{bmatrix} 0 & 2 & -1 \\ 5 & 7 & 2 \\ -1 & 0 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & -1 & 3 \\ 6 & 8 & 5 \\ 0 & 1 & 4 \end{bmatrix}$

find 4A - 2 B + 3 C.

Watch Video Solution

29. If A = diag [1,-2,3] B = diag [3,4,-6] and C = diag [0,1,2], find A - 2 B + 3C

Watch Video Solution

30. If $A = \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$ and $B = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$. Compute $(\sin\theta)A + (\cos\theta)$ B.

Watch Video Solution

31. If A, B, C are three matrices of the same order, then $A = B \Rightarrow A + C = B + C.$

Watch Video Solution

32. If A,B,C are three matrices such that A + B = A + C, then prove that B = C.

Watch Video Solution

33. Find the vale of (x+y) from the following equation:

$$2\begin{bmatrix} x & 5 \\ 7 & y-3 \end{bmatrix} + \begin{bmatrix} 3 & -4 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 7 & 6 \\ 15 & 14 \end{bmatrix}$$

Watch Video Solution

34. Find the matrix X such that 2A + B + X = O, where $A =$ [(-1,2), (3,4)] and B = [(3,-2),(1,5)]`

Watch Video Solution

35. If $A = \begin{bmatrix} 8 & 0 \\ 4 & -2 \\ 3 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -2 \\ 4 & 2 \\ -5 & 1 \end{bmatrix}$, then find the matrix X, such that `2 A + 3 X = B.

Watch Video Solution

36. Find A and B if $2A + 3B = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 0 & 1 \end{bmatrix}$ and $A - 2B = \begin{bmatrix} 3 & 0 & 1 \\ -1 & 6 & 2 \end{bmatrix}$.

Watch Video Solution

37. Let $A = \begin{bmatrix} 1 & 3 & 2 \\ 0 & 1 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 \\ 0 & 1 \\ 2 & 3 \end{bmatrix}$. Show that $AB \neq BA$

Watch Video Solution

38. Let $A = \begin{bmatrix} 1 & 0 \\ 2 & 3 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 & 2 \\ 3 & 2 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 0 & 4 \\ -2 & 1 & 0 \\ 3 & 2 & 6 \end{bmatrix}$.

Verify that $(AB)C = A(BC)$

Watch Video Solution

39. Taking $A = \begin{bmatrix} 2 & 1 & 0 \\ -3 & -1 & 5 \end{bmatrix}, B = \begin{bmatrix} 0 & 2 & 3 \\ 2 & 0 & 1 \\ 1 & -1 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} -1 & 0 & 2 \\ 1 & 3 & 1 \\ 2 & -1 & 3 \end{bmatrix}$

verify that A (B+C) = AB + AC.

Watch Video Solution

40. Give examples of matrics A and B such that $AB \neq BA$

Watch Video Solution

41. Give an example of two matrices A and B such that AB =O when neither A = O nor B = O

Watch Video Solution

42. Give an example of matrices A,B and C such that AB = AC but $B \neq C, A \neq O.$

Watch Video Solution

43. Give an example of matrices A,B and C such that AB = AC but $B \neq C, A \neq O.$

Watch Video Solution

44. Evaluate the following products:

$$\begin{bmatrix} 2 \\ 4 \\ 6 \end{bmatrix} [123]$$

Watch Video Solution

45. Evaluate the following products:

$$\left(\begin{bmatrix} 1 & 3 \\ -1 & -4 \end{bmatrix} + \begin{bmatrix} 3 & -2 \\ -1 & -1 \end{bmatrix} \right) \begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \end{bmatrix}$$

Watch Video Solution

46. Evaluate the following products:

$$\begin{bmatrix} 6 & 9 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} 2 & 6 & 0 \\ 7 & 9 & 8 \end{bmatrix}$$

Watch Video Solution

47. Evaluate the following

$$[xyz]\begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}\begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

Watch Video Solution

48. If $A = \begin{bmatrix} 2 & -2 \\ -3 & 1 \end{bmatrix}$, then show that (A + I) (A - 4 I) = O

Watch Video Solution

49. A $= \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$, verify that $A^2 = I$

Watch Video Solution

50. If $A = \begin{bmatrix} 0 & 0 & 0 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}$, verify that $A^3 = O$

Watch Video Solution

51. If A $= \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$ then find $A^2 - 3A + 2I$

Watch Video Solution

52. If $A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & -2 & 1 \\ 4 & 2 & 1 \end{bmatrix}$, then show that : $A^2 - 23A - 40I \neq O$

Watch Video Solution

53. If $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and $E = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$, prove that $(aI + bE)^3 = a^3 I + 3a^2 bE$.

Watch Video Solution

54. If $A = \begin{bmatrix} 2 & 3 \\ -1 & 2 \end{bmatrix}$, then show that $A^2 - 4A + 7I = O$. Hence, evaluate A^5.

Watch Video Solution

55. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, then compute A^5 without computing A^3 and higher powers of A.

Watch Video Solution

56. If $A = \begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then find k so that $A^2 = kA - 2I$

Watch Video Solution

57. Find the value of a and b for which the following holds :

$$\begin{bmatrix} a & b \\ -a & 2b \end{bmatrix}\begin{bmatrix} 2 \\ -1 \end{bmatrix} = \begin{bmatrix} 5 \\ 4 \end{bmatrix}$$

Watch Video Solution

58. If [2x,3] $\begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix}\begin{bmatrix} x \\ 8 \end{bmatrix} = O$, find the value of 'x'.

Watch Video Solution

59. Find x, if $\begin{bmatrix} x & -5 & -1 \end{bmatrix}\begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}\begin{bmatrix} x \\ 4 \\ 1 \end{bmatrix} = 0$

Watch Video Solution

60. Find the matrix X so that $X\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} = \begin{bmatrix} -7 & -8 & -9 \\ 2 & 4 & 6 \end{bmatrix}$.

Watch Video Solution

61. Find A if $\begin{bmatrix} 4 \\ 1 \\ 3 \end{bmatrix} A = \begin{bmatrix} -4 & 8 & 4 \\ -1 & 2 & 1 \\ -3 & 6 & 3 \end{bmatrix}$

Watch Video Solution

62. Let $A = \begin{bmatrix} 2 & -1 \\ 3 & 4 \end{bmatrix}, B = \begin{bmatrix} 5 & 2 \\ 7 & 4 \end{bmatrix}, C = \begin{bmatrix} 2 & 5 \\ 3 & 8 \end{bmatrix}$ Find a matrix D such that CD – AB = O.

Watch Video Solution

63. If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$ find $A^2 - 5A + 4I$ and find a matrix X such that $A^2 - 5A + 4I + X = O$

Watch Video Solution

64. A trust fund has Rs. 30,000 that must be invested in two different types of bonds. The first bond pays 5% interest per year, and the second bond pays 7% interest per year. Using matrix multiplication, determine how to divide Rs.30,000 among the two types of bonds. If the trust fund must obtain an annual total interest of: Rs.2000

Watch Video Solution

65. Three schools A, B and C organised a mela for collecting funds for helping the rehabilitation of flood victims. They sold hand made fans, mats and plates form recylced material at a cost of Rs. 25, Rs. 100 and Rs 50 each. The number of articles sold are given below:

Article \ School	A	B	C
Hand-fans	40	25	35
Mats	50	40	50
Plates	20	30	40

Find the

funds collected by each school separately by selling the above articles. Also find the total funds collected for the purpose.

Watch Video Solution

66. If $A = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$, prove by induction that $A^n = \begin{bmatrix} 2^{n-1} & 2^{n-1} \\ 2^{n-1} & 2^{n-1} \end{bmatrix}$ for all natural numbers n.

Watch Video Solution

67. If $A = \begin{pmatrix} 3 & -4 \\ 1 & -1 \end{pmatrix}$, then prove by Mathematical Induction that : $A^n = \begin{pmatrix} 1+2n & -4n \\ n & 1-2n \end{pmatrix}$, where $n \in N$

Watch Video Solution

68. If $A = [(\cos\alpha \sin\alpha), (-\sin\alpha, \cos\alpha)]$, prove (by inducton) that $A^n = [(\cos n\alpha, \sin n\alpha), (-\sin n\alpha \cos n\alpha)]$ for all positive integral n.

Watch Video Solution

69. f A and B are square matrices of the same order such that AB = BA, then prove by induction that $AB^n = B^n A$ Further, prove that $(AB)^n = A^n B^n$ for all $n \in N$

Watch Video Solution

70. f A and B are square matrices of the same order such that AB = BA, then prove by induction that $AB^n = B^n A$ Further, prove that $(AB)^n = A^n B^n$ for all $n \in N$

Watch Video Solution

71. If $F(\theta) = \begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$, then show that $F(\theta)F(\phi) = F(\theta + \phi)$.

Watch Video Solution

72. Let A and B be square matries of the same type. Does $(A+B)^2 = A^2 + 2AB + B^2$ hold? If not why?

Watch Video Solution

73. If A and B be square matrices of the same order such that BA=AB, prove that :

$(A+B)^3 = A^3 + 3A^2B + 3AB^2 + B^3$

Watch Video Solution

74. If A is a square matrix such that $A^2 = A$, show that $(I + A)^3 = 7A + I$.

Watch Video Solution

75. Let $A = \begin{bmatrix} 1 & -2 & 3 \\ 0 & 4 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 & 2 \\ 2 & -2 & 1 \end{bmatrix}$ verify that $(A + B)^t = A^t + B^t$

Watch Video Solution

76. Let $A = \begin{bmatrix} 1 & -2 & 3 \\ 0 & 4 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 & 2 \\ 2 & -2 & 1 \end{bmatrix}$ verify that $(2A)^t = 2A^t$

Watch Video Solution

77. If $A = \begin{bmatrix} 1 & -2 \\ 3 & 0 \\ 5 & 6 \end{bmatrix}, B = \begin{bmatrix} 0 & -3 & 4 \\ 1 & 2 & 0 \end{bmatrix}$, verify that (AB)' = B'A'

Watch Video Solution

78. If A $= \begin{bmatrix} -2 \\ 4 \\ 5 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 & -6 \end{bmatrix}$, then verify that (AB)' = B'A'

Watch Video Solution

79. If A is any square matrix, prove that $(A^n)' = (A')^n$, where n is any positive integer.

Watch Video Solution

80. If $A = \begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$, show that $\left(A - A^T\right)$ is a skew symmetric matrix, where A^T is the transpose of matrix A.

Watch Video Solution

81. Express $\begin{bmatrix} 3 & -4 \\ 1 & -1 \end{bmatrix}$ as the sum of symmetric and skew-symetric matrices.

Watch Video Solution

82. Express $\begin{bmatrix} 2 & 4 & -1 \\ 3 & 5 & 8 \\ 1 & -2 & 1 \end{bmatrix}$ as the sum of a symmetric and a skew-symmetric matrix.

Watch Video Solution

83. If A and B are symmetric matrices of the same order, then show that AB is symmetric if and only if A and B commute, that is AB = BA.

Watch Video Solution

84. If A and B are square matrices of the same order and A is skew-symmetric, prove that B^tAB is also skew symmetric.

Watch Video Solution

85. If A is a skew symmetric matrix, then show that A^n is symmetric if n is even and A^n is skew symmetric if n is odd, $n \in N$.

Watch Video Solution

86. Verify that the matrix $[(2, 3), 3, 4)]$ is inverse of the matrix $[-4, 3), (3, -2)]$

Watch Video Solution

87. Inverse of $f(x) = \begin{bmatrix} \cos x & \sin x & 0 \\ -\sin x & \cos x & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is

Watch Video Solution

88. Show that $\begin{bmatrix} 2 & -1 & 3 \\ -5 & 3 & 1 \\ -3 & 2 & 3 \end{bmatrix}$ is inverse of the matrix $\begin{bmatrix} -7 & -9 & 10 \\ -12 & -15 & 17 \\ 1 & 1 & -1 \end{bmatrix}$

Watch Video Solution

89. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, prove thst $A^2 - 4A - 5I = O$ and hence, obtain A^{-1}.

Watch Video Solution

90. By using elementary row transformations, find the inverse of the matrix A if it exists, where

$A = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$

Watch Video Solution

91. By using elementary row transformations, find the inverse of the matrix A if it exists, where

$A = \begin{bmatrix} 2 & 1 \\ 4 & 2 \end{bmatrix}$

Watch Video Solution

92. By using elementary row transformations, find the inverse of the matrix A if it exists, where

$$A = \begin{bmatrix} 10 & -2 \\ -5 & 1 \end{bmatrix}$$

Watch Video Solution

93. By using elementary row transformations, find A^{-1}, where

$$A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$$

Watch Video Solution

94. By using elementary row transformations, find A^{-1}, where

$$\begin{bmatrix} 2 & -1 & 4 \\ 4 & 0 & 2 \\ 3 & -2 & 7 \end{bmatrix}$$

Watch Video Solution

Exercise

1. IF a matrix has 12 elements, what are the possible orders it has 7 elements?

Watch Video Solution

2. Give an examples of a matrix which is a row as well as a column matrix.

Watch Video Solution

3. Give an example of a matrix which is a scalar matrix which is not a unit matrix.

Watch Video Solution

4. Give an example of a matrix which is a diagonal matrix which is not a scalar matrix.

Watch Video Solution

5. Classify the following matries:

$[1 + I - 3\sqrt{2}i]$

Watch Video Solution

6. Classify the following matries:

$$\begin{bmatrix} \sqrt{2} & 0 \\ \sqrt{3} & 2 \end{bmatrix}$$

Watch Video Solution

7. Classify the following matries:

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

Watch Video Solution

8. Classify the following matries:

$$\begin{bmatrix} -2 & 0 \\ 0 & 1 \end{bmatrix}$$

Watch Video Solution

9. Classify the following matries:

$$\begin{bmatrix} 0 & 2 & 2 \\ 2 & 0 & 2 \\ 2 & 2 & 0 \end{bmatrix}$$

Watch Video Solution

10. Classify the following matries:

$$\begin{bmatrix} 4 & 0 & 0 & 0 \\ 0 & 4 & 0 & 0 \\ 0 & 0 & 4 & 0 \\ 0 & 0 & 0 & 4 \end{bmatrix}$$

Watch Video Solution

11. Classify the following matries:

$[(1, 0, 0, 0), (0, 1, 0, 0), (0, 0, 1, 0), (0, 0, 01)]$

Watch Video Solution

12. Classify the following matries:

$$\begin{bmatrix} 2-i \\ -3 \\ 0 \\ 6 \end{bmatrix}$$

Watch Video Solution

13. Construct a $2x3$ matrix $A = [a_{ij}]$ for which $a_{ij} = i + j$

Watch Video Solution

14. Construct a 2×3 matrix $A = [a_{ij}]_{2 \times 3}$ for which $a_{ij} = i - j$

Watch Video Solution

15. Construct a 2×3 matrix $A = [a \text{ if }]$ for which $a_{ij} = \frac{i}{j}$

Watch Video Solution

16. Construct a 3×5 matrix $B = [b_{ij}]$ such that $b_{ij} = i + j$

Watch Video Solution

17. Construct a 3×5 matrix $B = [b_{ij}]$ such that $b_{ij} = i - j$

Watch Video Solution

18. Construct a 3×5 matrix $B = [b_{ij}]$ such that $b_{ij} = \ = ij$

Watch Video Solution

19. Construct a 3×5 matrix $B = [b_{ij}]$ such that $b_{ij} = \ = \frac{i}{j}$

Watch Video Solution

20. If $\begin{bmatrix} x - y & z \\ 2x - y & w \end{bmatrix} = \begin{bmatrix} -1 & 4 \\ 0 & 5 \end{bmatrix}$, find x , y , z and w.

Watch Video Solution

21. If $\begin{bmatrix} a & 3a-b \\ 2a+c & 3b-d \end{bmatrix} = \begin{bmatrix} 3 & 2 \\ 4 & 7 \end{bmatrix}$, find a, b, c and d.

Watch Video Solution

22. If $\begin{bmatrix} a+b & 2 \\ 5 & ab \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$, find the values of a and b.

Watch Video Solution

23. Find the values of x,y,z and w from the following equation :

$$\begin{bmatrix} x-y & 2x+z \\ 2x-y & 3z+w \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$$

Watch Video Solution

24. If $\begin{bmatrix} a+4 & 3b \\ 8 & -6 \end{bmatrix} = \begin{bmatrix} 2a+2 & b^2+2 \\ 8 & b^2-5b \end{bmatrix}$, find the values of a and b.

Watch Video Solution

25. Find x,y, a and b if $\begin{bmatrix} 2x+3y & a+b & 8 \\ 1 & 4x+y & 3a-4b \end{bmatrix} = \begin{bmatrix} 7 & 1 & 8 \\ 1 & 9 & 10 \end{bmatrix}$

.

Watch Video Solution

26. Given an example of three matrices A, B and C of the same type for which $(A-B)+C \neq A-(B+C)$

Watch Video Solution

27. Let $A = \begin{bmatrix} 1 & -2 & 0 \\ -1 & 3 & 5 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 & 2 \\ 2 & 0 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & -1 & 3 \\ 0 & 1 & 4 \end{bmatrix}$.

Verify that (A+B) + C = A + (B+C)`

Watch Video Solution

28. If $A = \begin{bmatrix} 1 & 3 & 2 \\ 2 & 0 & -1 \\ 1 & -1 & 0 \end{bmatrix}, B = \begin{bmatrix} 2 & 1 & 6 \\ -1 & 0 & 3 \\ 4 & 2 & -1 \end{bmatrix}$ and $C = \begin{bmatrix} -3 & 6 & 1 \\ 0 & 2 & -1 \\ 4 & 5 & 2 \end{bmatrix}$, verify that (A+B)+C=A+(B+C)

Watch Video Solution

29. Let $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ Find each of the following :

2A + B

Watch Video Solution

30. Let $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ Find each of the following :

3 A - B - C

Watch Video Solution

Watch Video Solution

31. Evaluate the following:

$$\begin{vmatrix} a & b \\ -b & a \end{vmatrix}$$

Watch Video Solution

32. Evaluate the following:

$$\begin{bmatrix} 1+i & 0 \\ 2 & 2-3i \end{bmatrix} - \begin{bmatrix} i & -1 \\ 3+i & 2i \end{bmatrix}$$

Watch Video Solution

33. Compute the following: :

$$\begin{bmatrix} a^2+b^2 & b^2+c^2 \\ a^2+c^2 & a^2+b^2 \end{bmatrix} + \begin{bmatrix} 2ab & 2bc \\ -2ac & -2ab \end{bmatrix}$$

Watch Video Solution

34. If $A = \begin{bmatrix} 5 & 3 \\ 4 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 1 \\ -1 & 2 \end{bmatrix}, C = \begin{bmatrix} -3 & 2 \\ -7 & 5 \end{bmatrix}$ find 2 A + 3 B - 4 C

Watch Video Solution

35. If $A = \begin{bmatrix} 3 & 8 & 0 \\ 1 & 6 & 7 \\ 0 & 2 & -5 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 6 & 9 \\ 3 & 0 & 4 \\ 2 & 3 & 11 \end{bmatrix}$, find 2 A - 3 B.

Watch Video Solution

36. If A is any matrix and k any scalar, then prove that (-k) A = -(kA) = K(-A)

Watch Video Solution

37. If A and B are matrices of the same order, then prove that -(A + B) = -A - B

Watch Video Solution

38. Find x and y if $2\begin{bmatrix}1 & 3\\ 0 & x\end{bmatrix}+\begin{bmatrix}y & 0\\ 1 & 2\end{bmatrix}=\begin{bmatrix}5 & 6\\ 1 & 8\end{bmatrix}$

Watch Video Solution

39. Find x, y if $3\begin{bmatrix}4 & 2\\ 1 & 3\end{bmatrix}-2\begin{bmatrix}-2 & 1\\ 3 & 2\end{bmatrix}+\begin{bmatrix}x & -4\\ 3 & y\end{bmatrix}=0$

Watch Video Solution

40. Find the vlaues of a,b,c and d if $3\begin{bmatrix}a & b\\ c & d\end{bmatrix}=\begin{bmatrix}a & 6\\ -1 & 2d\end{bmatrix}+\begin{bmatrix}4 & a+b\\ c+d & 3\end{bmatrix}$

Watch Video Solution

41. Find non-zero values of 'x', satisfying the matrix equation:

$$x\begin{bmatrix}2x & 2\\ 3 & x\end{bmatrix}+2\begin{bmatrix}8 & 5x\\ 4 & 4x\end{bmatrix}=2\begin{bmatrix}x^2+8 & 24\\ 10 & 6x\end{bmatrix}$$

Watch Video Solution

42. If $A=\begin{bmatrix}1 & -3 & 2\\ 2 & 0 & 2\end{bmatrix}, B=\begin{bmatrix}2 & -1 & -1\\ 1 & 0 & -1\end{bmatrix}$, find the matrix C such that A +B + C is a zero matrix.

Watch Video Solution

43. If $A=\begin{bmatrix}7 & 8\\ 1 & 9\end{bmatrix}$ and $B=\begin{bmatrix}7 & 12\\ 5 & 1\end{bmatrix}$, find the matrix C such that 3 A + 5 B + 2 C is a null matrix.

Watch Video Solution

44. Find the matrix 'X' and 'Y' if:

$2X + 3Y = \begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}$ and $3X - 2Y = \begin{bmatrix} 2 & -2 \\ -1 & 5 \end{bmatrix}$

Watch Video Solution

45. Find X and Y if $X + Y = \begin{bmatrix} 5 & 2 \\ 0 & 9 \end{bmatrix}$ and $X = Y = \begin{bmatrix} 3 & 6 \\ 0 & -1 \end{bmatrix}$

Watch Video Solution

46. Find a matrix X such that 2A - B + X = O, where $A = \begin{bmatrix} 3 & 1 \\ 0 & 2 \end{bmatrix}, B = \begin{bmatrix} -2 & 1 \\ 0 & 3 \end{bmatrix}$

Watch Video Solution

47. Find the matrix A so that $\begin{bmatrix} 1 & 2 & -3 \\ 0 & 4 & 1 \end{bmatrix} + A = \begin{bmatrix} 3 & 5 & 6 \\ -1 & 0 & 3 \end{bmatrix}$.

Watch Video Solution

48. Find matrices X and Y is

$$2X - Y = \begin{bmatrix} 6 & -6 & 0 \\ -4 & 2 & 1 \end{bmatrix} \text{ and } X + 2Y = \begin{bmatrix} 3 & 2 & 5 \\ -2 & 1 & 7 \end{bmatrix}$$

Watch Video Solution

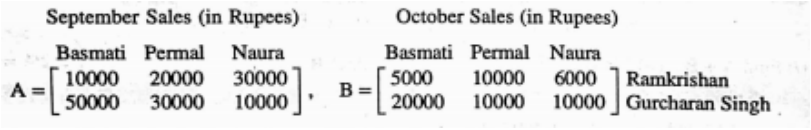
49. If $A - B = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ and $A + B = \begin{bmatrix} 3 & 5 & 7 \\ -1 & 1 & 4 \\ 11 & 8 & 0 \end{bmatrix}$, find A and B.

Watch Video Solution

50. If $A = \begin{bmatrix} 9 & 1 \\ 7 & 8 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix}$, find the matrix C such that 5 A + 3 B + 2 C is a null matrix.

Watch Video Solution

51. Two farmers Ramkishan and Gurcharan singh cultivate only the varieties of rice namely Basmati, Permal and Naura. The sales (in Rupees) of these varieties of rice by both the farmers in the months of September and October are given by the following matrices A and B.



Find the combined sales in September and October for each farmer in each variety.

Watch Video Solution

52. Two farmers Ramkishan and Gurcharan singh cultivate only the varieties of rice namely Basmati, Permal and Naura. The sales (in Rupees) of these varieties of rice by both the farmers in the months of September and October are given by the following matrices A and B.

September Sales (in Rupees)

$$A = \begin{matrix} & \text{Basmati} & \text{Permal} & \text{Naura} \\ \end{matrix} \begin{bmatrix} 10000 & 20000 & 30000 \\ 50000 & 30000 & 10000 \end{bmatrix}$$

October Sales (in Rupees)

$$B = \begin{matrix} & \text{Basmati} & \text{Permal} & \text{Naura} \\ \end{matrix} \begin{bmatrix} 5000 & 10000 & 6000 \\ 20000 & 10000 & 10000 \end{bmatrix} \begin{matrix} \text{Ramkrishan} \\ \text{Gurcharan Singh} \end{matrix}$$

Find the decrease in sales from September to october.

Watch Video Solution

53. Two farmers Ramkishan and Gurcharan singh cultivate only the varieties of rice namely Basmati, Permal and Naura. The sales (in Rupees) of these varieties of rice by both the farmers in the months of September and October are given by the following matrices A and B.

September Sales (in Rupees)

$$A = \begin{matrix} & \text{Basmati} & \text{Permal} & \text{Naura} \\ \end{matrix} \begin{bmatrix} 10000 & 20000 & 30000 \\ 50000 & 30000 & 10000 \end{bmatrix}$$

October Sales (in Rupees)

$$B = \begin{matrix} & \text{Basmati} & \text{Permal} & \text{Naura} \\ \end{matrix} \begin{bmatrix} 5000 & 10000 & 6000 \\ 20000 & 10000 & 10000 \end{bmatrix} \begin{matrix} \text{Ramkrishan} \\ \text{Gurcharan Singh} \end{matrix}$$

If both farmers receive 2% profit on gross sales, compute the profit for each farmer and for each variety solid on October.

Watch Video Solution

54. Taking $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 \\ 2 & 5 \end{bmatrix}$, verify that (A+B)' = A'+B'

Watch Video Solution

55. Taking $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 \\ 2 & 5 \end{bmatrix}$, verify that (AB)' = B'A'

Watch Video Solution

56. Taking $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 \\ 2 & 5 \end{bmatrix}$, verify that (2A)' = 2A'

Watch Video Solution

57. If $A = \begin{bmatrix} 3 \\ 5 \\ 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 & 4 \end{bmatrix}$, verify that (AB)' = B'A'

Watch Video Solution

58. If $A = \begin{bmatrix} 3 & \sqrt{3} & 2 \\ 4 & 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & -1 & 2 \\ 1 & 2 & 4 \end{bmatrix}$, then verify that :

(A+B)'=A'+B'

Watch Video Solution

59. If $A = \begin{bmatrix} 2 & 4 & -1 \\ -1 & 0 & 2 \end{bmatrix}, B = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 2 & 1 \end{bmatrix}$. Find (AB)'

Watch Video Solution

60. For the matrices A and B, $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 1 & 0 \end{bmatrix}, B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 5 & 0 \end{bmatrix}$,

verify that (AB)' = B'A'

Watch Video Solution

61. If $A = \begin{bmatrix} 5 & 1 & 1 \\ 2 & 3 & 0 \end{bmatrix}, B = \begin{bmatrix} 2 & 3 \\ -1 & 1 \\ 4 & 0 \end{bmatrix}$, verify that (AB)' = B'A'.

Watch Video Solution

62. If $A = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$, verify that $AA' = I_2 = A'A$

Watch Video Solution

63. If $A = \begin{pmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{pmatrix}$, find $'\alpha'$ satisfying $0 < alpa < \frac{\pi}{2}$ when $A + A^T = \sqrt{2}I_2$, where A^T is transpose of A.

Watch Video Solution

64. If $A = \begin{bmatrix} -1 & 2 & -3 \\ 4 & -5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -4 \\ 2 & 1 \\ -1 & 0 \end{bmatrix}$, verify that (BA)' = A'B'

Watch Video Solution

65. if $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 1 & -1 \\ a & 2 & b \end{bmatrix}$ is a matrix satisfying $AA' = 9I_3$, find the value of $|a| + |b|$.

Watch Video Solution

66. Express the matrix $\begin{bmatrix} 2 & 3 \\ -7 & 5 \end{bmatrix}$ as the sum of a symmetric and a skew-symmetric and a skew-symmetric matrix.

Watch Video Solution

67. If $A = \begin{bmatrix} p & q \\ r & s \end{bmatrix}$, then express A as the sum of a symmetric and a skew-symmetric matrix.

Watch Video Solution

68. show that the matrix

$A = \begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ is idempotent.

Watch Video Solution

69. Express each of the matrices $\begin{bmatrix} 6 & 3 & -2 \\ 5 & 7 & 9 \\ 4 & 7 & 1 \end{bmatrix}$ as the sum of a symmetric and a skew-symmetric matrix.

Watch Video Solution

70. If A and B are symmetric matrices of the same order. Show that A-B is also symmetric.

Watch Video Solution

71. If A and B are skew-symmetric matrices of the same order. Show that A-B is also skew-symmetric.

Watch Video Solution

72. If A is any square matrix, show that $\frac{1}{2}(A + A')$ is symmetric and $\frac{1}{2}(A - A')$ is skew-symmetric.

Watch Video Solution

73. If A and B are square matrices of the same order and A is symmetric, then show that B^tAB is also symmetric.

Watch Video Solution

74. If A is a symmetric matrix, prove that A^n is also symmetric for all positive integral n.

Watch Video Solution

75. Verify that $\begin{bmatrix} 2 & 3 \\ 5 & 7 \end{bmatrix}$ is inverse of the matrix $\begin{bmatrix} -7 & 3 \\ 5 & -2 \end{bmatrix}$

Watch Video Solution

76. Verify that $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ and $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ are inverse of each other.

Watch Video Solution

77. Verify that the matrix $\begin{bmatrix} 7 & -3 & -3 \\ -1 & 1 & 0 \\ -1 & 0 & 1 \end{bmatrix}$ is the inverse of the matrix $\begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$

Watch Video Solution

78. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ then the matrix $A^2 - 5A + 8I$ is

Watch Video Solution

79. If Matrix $A = \begin{bmatrix} 5 & 3 \\ -1 & -2 \end{bmatrix}$, then show that $A^2 - 3A - 7I = 0$ and hence find A^{-1} from this equation.

Watch Video Solution

80. Using the elementary row operations, find the inverse of each of the following matrices:

$$\begin{bmatrix} 1 & 2 \\ 3 & 7 \end{bmatrix}$$

Watch Video Solution

81. Using the elementary row operations, find the inverse of each of the following matrices:

$$\begin{bmatrix} 2 & 1 \\ 7 & 4 \end{bmatrix}$$

Watch Video Solution

82. Using the elementary row operations, find the inverse of each of the following matrices:

$$\begin{bmatrix} 1 & 3 \\ -5 & 7 \end{bmatrix}$$

Watch Video Solution

Watch Video Solution

83. Using the elementary row operations, find the inverse of each of the following matrices:

$$\begin{bmatrix} 1 & -3 \\ -2 & 6 \end{bmatrix}$$

Watch Video Solution

84. Using the elementary row operations, find the inverse of each of the following matrices:

$$\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$$

Watch Video Solution

85. Using the elementary row operations, find the inverse of each of the following matrices:

$$\begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$$

Watch Video Solution

86. Using the elementary row operations, find the inverse of each of the following matrices:

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

Watch Video Solution

87. Using the elementary row operations, find the inverse of each of the following matrices:

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

Watch Video Solution

88. Using the elementary row operations, find the inverse of each of the following matrices:

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

Watch Video Solution

89. Using the elementary row operations, find the inverse of each of the following matrices:

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ -2 & -4 & -5 \end{bmatrix}$$

Watch Video Solution

90. Using the elementary row operations, find the inverse of each of the following matrices:

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

Watch Video Solution

91. If A is of order 3×4 and A + B is defined, then what is the order of B?

Watch Video Solution

92. If $\begin{bmatrix} x+y & 2 \\ -1 & 2x-y \end{bmatrix} = \begin{bmatrix} 4 & 2 \\ -1 & 5 \end{bmatrix}$, find x and y.

Watch Video Solution

93. Write down the identity matrix of order 2.

Watch Video Solution

94. If S it the set of all 2×2 matrices then find the identity element of the addition operation on s.

Watch Video Solution

95. Compute the product $[x, y]\begin{bmatrix} x \\ y \end{bmatrix}$

Watch Video Solution

96. If A and B are square matrices of the same order, compute (A+B). (A-B)

Watch Video Solution

97. If A and B are square matrices of the same order such that AB = BA, then compute (2A + B) (A + 2 B).

Watch Video Solution

98. Let S be the set of all 2×2 matrices. What is the identity element of the multiplication operation on S?

Watch Video Solution

99. If $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$, evaluate A^3

Watch Video Solution

100. If A is of order 2×3. Is it possible to compute A^2?

Watch Video Solution

101. Find x if $\begin{bmatrix} x^2 \\ 9 \end{bmatrix} - 3\begin{bmatrix} x \\ 9 \end{bmatrix} = \begin{bmatrix} -2 \\ -18 \end{bmatrix}$

Watch Video Solution

102. Find A^2 if A $= \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$

Watch Video Solution

103. If A = [1 2 3], evaluate A^t.

Watch Video Solution

104. if A = [a b c], evaluate $A^T A$.

Watch Video Solution

105. If $A = \begin{bmatrix} 1 & 2 & -1 \\ x & 3 & y \\ -1 & 6 & 4 \end{bmatrix}$ is a symmetric matrix, find x,y.

Watch Video Solution

106. If A is a skew symmetric matrix of order 3, write down its (2,2)th element.

Watch Video Solution

107. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$, find A^{-1}

Watch Video Solution

108. If $A = \begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}$, find A^{-1}

Watch Video Solution

109. If A of order 2×2, state whether $\frac{1}{2}(A + A^T)$ is symmetric or skew symmetric.

Watch Video Solution

110. If $A = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$, compute A^3

Watch Video Solution

111. If $A = \begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}$, compute 2A - B.

Watch Video Solution

112. If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ and $B = \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$, evaluate $A\cos\theta + B\sin\theta$.

Watch Video Solution

Watch Video Solution

113. Find the matrix X such that A + 2 B + X = O, where $A = \begin{bmatrix} 3 & -2 \\ 1 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 \\ 3 & 4 \end{bmatrix}$

Watch Video Solution

114. Write down a scalar matrix of order 2 whose (2,2)th entry is -1.

Watch Video Solution

115. Give an example of a 3×3 lower triangular matrix.

Watch Video Solution

116. If A is of order 5×3, what is the number of elements in a row of A?

Watch Video Solution

117. If A is of order $m \times n$, find the number of elements in a column of A.

Watch Video Solution

118. If A is of order $m \times 2$ and both A + B and AB are defined, find m.

Watch Video Solution

119. Write the diagonal of the matrix $A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 0 & 3 \\ 3 & 6 & 4 \end{bmatrix}$.

Watch Video Solution

120. Find the number of all possible matrices of order 2×2 with entries 0,1 or 2.

Watch Video Solution

121. If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 & 2 \\ 4 & 3 & 1 \end{bmatrix}, C = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$ and $D = \begin{bmatrix} 4 & 6 & 8 \\ 5 & 7 & 9 \end{bmatrix}$, then which of the sums A+B,B+C, C+D and B+D is defined?

Watch Video Solution

122. If A 3×3 invertible matrix, then show that for any scalar 'k' (non-zero), kA is invertible and $(kA)^{-1} = \frac{1}{k}A^{-1}$

Watch Video Solution

123. If [2x,3] $\begin{bmatrix} 1 & 2 \\ -3 & 0 \end{bmatrix} \begin{bmatrix} x \\ 8 \end{bmatrix} = O$, find the value of 'x'.

Watch Video Solution

124. If $P = \begin{bmatrix} x & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & z \end{bmatrix}$ and $Q = \begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$, verify that PQ = QP = $\begin{bmatrix} xa & 0 & 0 \\ 0 & yb & 0 \\ 0 & 0 & zc \end{bmatrix}$

Watch Video Solution

125. Find x,y if $x \begin{bmatrix} 2 \\ 1 \end{bmatrix} + y \begin{bmatrix} 3 \\ 5 \end{bmatrix} - \begin{bmatrix} -8 \\ -11 \end{bmatrix} = O$

Watch Video Solution

126. If possible , find the sum of the matrices of A and B, where $A = \begin{bmatrix} \sqrt{3} & 1 \\ 2 & 3 \end{bmatrix}$ and $b = \begin{bmatrix} x & y & z \\ a & b & c \end{bmatrix}$

Watch Video Solution

127. If $A = \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$, then for what value of α, is A an identity matrix?

Watch Video Solution

128. If $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}, \begin{pmatrix} 3 & 1 \\ 2 & 5 \end{pmatrix}, = \begin{pmatrix} 7 & 11 \\ k & 23 \end{pmatrix}$, then write the value of 'k'

Watch Video Solution

129. If $A = [(2, 3), (5, -2)$, write A^{-1} in terms of A.

Watch Video Solution

130. If A is a square matrix such that $A^2 = A$, then write the value of $7A - (I + A)^3$, where I is an identity matrix.

Watch Video Solution

131. Solve the following equations for x : $[x1]\begin{bmatrix} 1 & 0 \\ -2 & 0 \end{bmatrix} = 0$

Watch Video Solution

132. Find x, if any such that $\begin{bmatrix} 3 & 4 \\ -1 & x \end{bmatrix} = \begin{bmatrix} 0 & x+2 \\ -1 & 2 \end{bmatrix}$

Watch Video Solution

133. If $\begin{bmatrix} a+4 & 3b \\ 8 & -6 \end{bmatrix} = \begin{bmatrix} 2a+2 & b+2 \\ 8 & a-8b \end{bmatrix}$ write the value of $a-2$ b .

Watch Video Solution

134. If matrix $A = \begin{bmatrix} 2 & -2 \\ -2 & 2 \end{bmatrix}$ and $A^2 = \lambda A$, then write the value of `lambda'.

Watch Video Solution

135. If $\begin{bmatrix} xy & 4 \\ z+6 & x+y \end{bmatrix} = \begin{bmatrix} 8 & w \\ 0 & 6 \end{bmatrix}$, write the value of x + y + z.

Watch Video Solution

136. In the matrix $A = \begin{bmatrix} 2 & 5 & 19 & -7 \\ 35 & -2 & \frac{5}{2} & 12 \\ \sqrt{3} & 1 & -5 & 17 \end{bmatrix}$, write: The order of the matrix.

Watch Video Solution

137. In the matrix $A = \begin{bmatrix} 2 & 5 & 19 & -7 \\ 35 & -2 & \frac{5}{2} & 12 \\ \sqrt{3} & 1 & -5 & 17 \end{bmatrix}$, write:The number of elements.

Watch Video Solution

138. In the matrix $A = \begin{bmatrix} 2 & 5 & 19 & -7 \\ 35 & -2 & \frac{5}{2} & 12 \\ \sqrt{3} & 1 & -5 & 17 \end{bmatrix}$, write: write the elements $a_{13}, a_{21}, a_{33}, a_{24}, a_{23}$

Watch Video Solution

139. If a matrix has 24 elements, what are the possible orders it can have? What, if it has 13 elements?

Watch Video Solution

140. If a matrix has 18 elements, what are the possible orders it can have? What, if it has 5 elements?

Watch Video Solution

141. Construct a2×2 matrix, $A = [A_{ij}]$. Whose elements are given by : $A_{ij} = \frac{(i+j)^2}{2}$

Watch Video Solution

142. Construct $a2 \times 2$ matrix $A = [a_{ij}]$ whose elements are given by $a_{ij} = \frac{i}{j}$

Watch Video Solution

143. Construct a 2×2 matrix $A = [a_{ij}]$ whose elements are given by:

$a_{ij} = \frac{(i + 2j)^2}{2}$

Watch Video Solution

144. Construct a 3×4 matrix, whose elements are given by: $a_ij = \frac{1}{2}| - 3i + j|$

Watch Video Solution

145. Construct a 3×4 matrix, whose elements are given by:

$a_ij = 2i - j$

Watch Video Solution

146. Find the values of x, y and z from the following equation:

$$\begin{bmatrix} 4 & 3 \\ x & 5 \end{bmatrix} = \begin{bmatrix} y & z \\ 1 & 5 \end{bmatrix}$$

Watch Video Solution

147. Find the value of x, y, z from the following equation

$$\begin{bmatrix} x+y & 2 \\ 5+z & xy \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$$

Watch Video Solution

148. Find the values of x, y and z from the following equation:

$$\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 9 \\ 5 \\ 7 \end{bmatrix}$$

Watch Video Solution

149. Find the values of a, b, c and d from the equation : $\begin{bmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$ and write correct answer from the following:

Watch Video Solution

150. $A = [a_{ij}]_{m \times n}$ is a square matrix, if

a. m < n

b. m > n

c. m = n

d. none of these

A. mltn

B. mgtn

C. m=n

D. none of these

Answer:

Watch Video Solution

151. Which of the given values of x and y make the following pair of matrices equal

$$\begin{bmatrix} 3x+7 & 5 \\ y+1 & 2-3x \end{bmatrix}, \begin{bmatrix} 0 & y-2 \\ 8 & 4 \end{bmatrix}$$

A. $x = -\frac{1}{3}, y = 7$

B. Not possible to find

C. $y = 7, x = -\frac{2}{3}$

D. $x = -\frac{1}{3}, y = -\frac{2}{3}$

Answer:

Watch Video Solution

152. The number of all possible matrices of order 3×3 with each entry 0 or 1 is:

A. 27

B. 18

C. 81

D. 512

Answer:

Watch Video Solution

153. Let A $= \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$. Find the followiing :

A+ B

Watch Video Solution

154. Let A $= \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$. Find the followiing :

A - B

Watch Video Solution

155. Let $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ find A-C

Watch Video Solution

156. Let $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$ find AB

Watch Video Solution

157. Let $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}, C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$, Find the following: BA

Watch Video Solution

158. Compute the following: : $\begin{bmatrix} a & b \\ -b & a \end{bmatrix} + \begin{bmatrix} a & b \\ b & a \end{bmatrix}$

Watch Video Solution

159. Compute the following: :

$$\begin{bmatrix} a^2+b^2 & b^2+c^2 \\ a^2+c^2 & a^2+b^2 \end{bmatrix} + \begin{bmatrix} 2ab & 2bc \\ -2ac & -2ab \end{bmatrix}$$

Watch Video Solution

160. Compute the following:

$$\begin{bmatrix} -1 & 4 & -6 \\ 8 & 5 & 16 \\ 2 & 8 & 5 \end{bmatrix} + \begin{bmatrix} 12 & 7 & 6 \\ 8 & 0 & 5 \\ 3 & 2 & 4 \end{bmatrix}$$

Watch Video Solution

161. Compute the following: : $\begin{bmatrix} \cos^2 x & \sin^2 x \\ \sin^2 x & \cos^2 x \end{bmatrix} + \begin{bmatrix} \sin^2 x & \cos^2 x \\ \cos^2 x & \sin^2 x \end{bmatrix}$

Watch Video Solution

162. Compute the indicated products: $\begin{bmatrix} a & b \\ -b & a \end{bmatrix} \begin{bmatrix} a & -b \\ b & a \end{bmatrix}$

Watch Video Solution

163. Compute the indicated products: $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} \begin{bmatrix} 2 & 3 & 4 \end{bmatrix}$

Watch Video Solution

164. Compute the indicated products: $\begin{bmatrix} 1 & -2 \\ 2 & 3 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix}$

Watch Video Solution

165. Compute the indicated products: $\begin{bmatrix} 2 & 3 & 4 \\ 3 & 4 & 5 \\ 4 & 5 & 6 \end{bmatrix} \begin{bmatrix} 1 & -3 & 5 \\ 0 & 2 & 4 \\ 3 & 0 & 5 \end{bmatrix}$

Watch Video Solution

166. Compute the indicated products: $\begin{bmatrix} 2 & 1 \\ 3 & 2 \\ -1 & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 & 1 \\ -1 & 2 & 1 \end{bmatrix}$

Watch Video Solution

Watch Video Solution

167. Compute the indicated products: $\begin{bmatrix} 3 & -1 & 3 \\ -1 & 0 & 2 \end{bmatrix} \begin{bmatrix} 2 & -3 \\ 1 & 0 \\ 3 & 1 \end{bmatrix}$

Watch Video Solution

168. If $A = \begin{bmatrix} 1 & 2 & -3 \\ 5 & 0 & 2 \\ 1 & -1 & 1 \end{bmatrix}, B = \begin{bmatrix} 3 & -1 & 2 \\ 4 & 2 & 5 \\ 2 & 0 & 3 \end{bmatrix}$ and $C = \begin{bmatrix} 4 & 1 & 2 \\ 0 & 3 & 2 \\ 1 & -2 & 3 \end{bmatrix}$, then compute $(A + B)$ and $(B - C)$. Also, verify that $A + (B - C) = (A + B) - C$.

Watch Video Solution

169. If $A = \begin{bmatrix} \frac{2}{3} & 1 & \frac{5}{3} \\ \frac{1}{3} & \frac{2}{3} & \frac{4}{3} \\ \frac{7}{3} & 2 & \frac{2}{3} \end{bmatrix}$ and $B = \begin{bmatrix} \frac{2}{5} & \frac{3}{5} & 1 \\ \frac{1}{5} & \frac{2}{5} & \frac{4}{5} \\ \frac{7}{5} & \frac{6}{5} & \frac{2}{5} \end{bmatrix}$, then compute $3A - 5B$

Watch Video Solution

170. Simplify, $\cos\theta \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix} + \sin\theta \begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$

Watch Video Solution

171. Find X and Y, if $X + Y = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

Watch Video Solution

172. Find X and Y, if $2X + 3Y = \begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}$ and $3X + 2Y = \begin{bmatrix} 2 & -2 \\ -1 & 5 \end{bmatrix}$

Watch Video Solution

173. Find X , if $Y = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ and $2X + Y = \begin{bmatrix} 1 & 0 \\ -3 & 2 \end{bmatrix}$

Watch Video Solution

174. Find x and y if $2\begin{bmatrix} 1 & 3 \\ 0 & x \end{bmatrix} + \begin{bmatrix} y & 0 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 5 & 6 \\ 1 & 8 \end{bmatrix}$

Watch Video Solution

175. Solve the equation for x,y,z and t, if $2\begin{bmatrix} x & z \\ y & t \end{bmatrix} + 3\begin{bmatrix} 1 & -1 \\ 0 & 2 \end{bmatrix} = 3\begin{bmatrix} 3 & 5 \\ 4 & 6 \end{bmatrix}$

Watch Video Solution

176. If $x\begin{bmatrix}2\\3\end{bmatrix}+y\begin{bmatrix}-1\\1\end{bmatrix}=\begin{bmatrix}10\\5\end{bmatrix}$, then find the value of x and y.

Watch Video Solution

177. Given $3\begin{bmatrix}x & y\\z & w\end{bmatrix}=\begin{bmatrix}x & 6\\-1 & 2w\end{bmatrix}+\begin{bmatrix}4 & x+y\\z+w & 3\end{bmatrix}$, find the values of x, y, z and w.

Watch Video Solution

178. If `F (x) = [[cos x,-sin x,0],[sin x, cos x, 0],[0,0,1], then show that F(x) F(y)= F (x+y).

Watch Video Solution

179. Show that: $\begin{bmatrix} 5 & -1 \\ 6 & 7 \end{bmatrix}\begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix} \neq \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}\begin{bmatrix} 5 & -1 \\ 6 & 7 \end{bmatrix}$

Watch Video Solution

180. Show that:

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

Watch Video Solution

181. If $A = \begin{bmatrix} 2 & 0 & 1 \\ 2 & 1 & 3 \\ 1 & -1 & 0 \end{bmatrix}$, then find $A^2 - 5A6I$

Watch Video Solution

182. If $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$, prove that $A^3 - 6A^2 + 7A + 2I = 0$

Watch Video Solution

183. If $A = \begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, then find k so that $A^2 = kA - 2I$

Watch Video Solution

184. If $A = \begin{bmatrix} 0 & -\frac{\tan\alpha}{2} \\ \frac{\tan\alpha}{2} & 0 \end{bmatrix}$ and I is the identity matrix of order 2, show that $I + A = (I - A)\begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$

Watch Video Solution

185. A trust fund has Rs. 30,000 that must be invested in two different types of bonds. The first bond pays 5% interest per year, and the second bond pays 7% interest per year. Using matrix multiplication, determine how to divide Rs.30,000 among the two

types of bonds. If the trust fund must obtain an annual total interest of: Rs.1800

Watch Video Solution

186. A trust fund has Rs. 30,000 that must be invested in two different types of bonds. The first bond pays 5% interest per year, and the second bond pays 7% interest per year. Using matrix multiplication, determine how to divide Rs.30,000 among the two types of bonds. If the trust fund must obtain an annual total interest of: Rs.2000

Watch Video Solution

187. Assume X, Y, Z, W and P are matrices of order $2 \times n, 3 \times k, 2 \times p, n \times 3$ and $p \times k$ respectively. The restriction on n, k and p so that PY + WY will be defined are:

A. k = 3, p =n

B. k is arbitrary, p = 2

C. p is arbitrary , k = 3

D. k = 2, p = 3

Answer:

Watch Video Solution

188. Assume X, Y, Z, W and P are matrices of order $2 \times n, 3 \times k, 2 \times p, n \times 3$ and $p \times k$ respectively.If n = p, then the order of the matrix $7X - 5Z$is:

A. $p \times 2$

B. $2 \times n$

C. $n \times 3$

D. $p \times n$

Answer:

Watch Video Solution

189. Find the transpose of each of the followig matrices.

$$\begin{bmatrix} 5 \\ \frac{1}{2} \\ -1 \end{bmatrix}$$

Watch Video Solution

190. Find the transpose of each of the followig matrices.

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

Watch Video Solution

191. Find the transpose of each of the following matrices:

$$\begin{bmatrix} -1 & 5 & 6 \\ \sqrt{3} & 5 & 6 \\ 2 & 3 & -1 \end{bmatrix}$$

Watch Video Solution

192. If $A = \begin{bmatrix} -1 & 2 & 3 \\ 5 & 7 & 9 \\ -2 & 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -4 & 1 & -5 \\ 1 & 2 & 0 \\ 1 & 3 & 1 \end{bmatrix}$, then show that (A +B) = A'+B'

Watch Video Solution

193. If $A = \begin{bmatrix} -1 & 2 & 3 \\ 5 & 7 & 9 \\ -2 & 1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -4 & 1 & -5 \\ 1 & 2 & 0 \\ 1 & 3 & 1 \end{bmatrix}$, then verify that $(A - B)' = A' - B'$

Watch Video Solution

194. If $A' = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & 1 \\ 1 & 2 & 3 \end{bmatrix}$, then porve that (A+B)' = A' + B'

Watch Video Solution

195. If $A' = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & 1 \\ 1 & 2 & 3 \end{bmatrix}$, then porve that (A-B)' = A' - B'

Watch Video Solution

196. If $A' = \begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 0 \\ 1 & 2 \end{bmatrix}$ then find (A+2B)'

Watch Video Solution

197. For the matrices A and B, verify that $(AB)' = B'A'$, where :

$$A = \begin{bmatrix} 1 \\ -4 \\ 3 \end{bmatrix}, B = \begin{bmatrix} -1 & 2 & 1 \end{bmatrix}$$

Watch Video Solution

198. For the matrices A and B, verify that $(AB)' = B'A'$, where :

$$A = \begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix}, B = \begin{bmatrix} 1 & 5 & 7 \end{bmatrix}$$

Watch Video Solution

199. If $A = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$, verify that AA' = I_2 = A'A

Watch Video Solution

200. If $A = \begin{bmatrix} \sin\alpha & \cos\alpha \\ -\cos\alpha & \sin\alpha \end{bmatrix}$, then prove that A'A = I.

Watch Video Solution

201. Show that the matrix $A = \begin{bmatrix} 1 & -1 & 5 \\ -1 & 2 & 1 \\ 5 & 1 & 3 \end{bmatrix}$ is a symmetric matrix.

Watch Video Solution

202. Show that the matrix $A = \begin{bmatrix} 0 & 1 & -1 \\ -1 & 0 & 1 \\ 1 & -1 & 0 \end{bmatrix}$ is a skew symmetric matrix.

Watch Video Solution

203. For the matrix $A = \begin{bmatrix} 1 & 5 \\ 6 & 7 \end{bmatrix}$, verify that $(A + A')$ is a symmetric matrix.

Watch Video Solution

204. For the matrix $A = \begin{bmatrix} 1 & 5 \\ 6 & 7 \end{bmatrix}$, verify that $(A - A')$ is a skew symmetric matrix.

Watch Video Solution

205. Find $\frac{1}{2}(A + A')$ and $\frac{1}{2}(A - A')$, when $A = \begin{bmatrix} 0 & a & b \\ -a & 0 & c \\ -b & -c & 0 \end{bmatrix}$.

Watch Video Solution

206. Express the following matrices as the sum of a symmetric and a skew symmetric matrix: : $\begin{bmatrix} 3 & 5 \\ 1 & -1 \end{bmatrix}$

Watch Video Solution

207. Express the following matrices as sum of a symmetric and a skew symmetric matrix

$\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$

Watch Video Solution

208. Express the following matrices as the sum of a symmetric and skew-symmetric matrix. $\begin{bmatrix} 3 & 3 & -1 \\ -2 & -2 & 1 \\ -4 & -5 & 2 \end{bmatrix}$

Watch Video Solution

209. Express the following matrices as sum of a symmetric and a skew symmetric matrix

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

Watch Video Solution

210. If A, B are symmetric matrices of same order, then AB - BA is a :

A. Skew-symmetric matrix

B. Symmetric matrix

C. Zero matrix

D. Identify matrix.

Answer:

Watch Video Solution

211. If $A = \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$, then A + A' = I, if the value of α is

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

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

C. p

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

Answer:

Watch Video Solution

212. Using elementary transformation, find the inverse of the following matrix

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

Watch Video Solution

213. Using elemenatry transformations, find the inverse of the following matrices

$$\begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$$

Watch Video Solution

214. Using elemenatry transformations, find the inverse of the following matrices

$$\begin{bmatrix} 1 & 3 \\ 2 & 7 \end{bmatrix}$$

Watch Video Solution

215. Using elemenatry transformations, find the inverse of the following matrices

$$\begin{bmatrix} 2 & 3 \\ 5 & 7 \end{bmatrix}$$

Watch Video Solution

216. Using the elementary row operations, find the inverse of each of the following matrices:

$$\begin{bmatrix} 2 & 1 \\ 7 & 4 \end{bmatrix}$$

Watch Video Solution

217. Using elementary transformation, find the inverse (if exists) of the following matrices

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

Watch Video Solution

218. Using elemenatry transformations, find the inverse of the following matrices

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

Watch Video Solution

219. Using elementary transformations find the inverse of the matrix

$A = \begin{bmatrix} 4 & 5 \\ 3 & 4 \end{bmatrix}$

Watch Video Solution

220. Using elemenatry transformations, find the inverse of the following matrices

$\begin{bmatrix} 3 & 10 \\ 2 & 7 \end{bmatrix}$

Watch Video Solution

221. Using elementary transformations find the inverse of the following matrice $\begin{bmatrix} 3 & -1 \\ -4 & 2 \end{bmatrix}$

Watch Video Solution

222. Using elementary transformations , find the inverse of the following matrice $\begin{bmatrix} 2 & -6 \\ 1 & -2 \end{bmatrix}$

Watch Video Solution

223. Using elemenatry transformations, find the inverse of the following matrices

$[(6, -3), (-2, 1)$

Watch Video Solution

224. Using elementary transformations , find the inverse of the following matrice $\begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix}$

Watch Video Solution

225. Using elemenatry transformations, find the inverse of the following matrices

$$\begin{bmatrix} 2 & 1 \\ 4 & 2 \end{bmatrix}.$$

Watch Video Solution

226. Using elemenatry transformations, find the inverse of the following matrices

$$\begin{bmatrix} 2 & -3 & 3 \\ 2 & 2 & 3 \\ 3 & -2 & 2 \end{bmatrix}$$

Watch Video Solution

227. Using elemenatry transformations, find the inverse of the following matrices

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

Watch Video Solution

228. Using elemenatry transformations, find the inverse of the following matrices

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

Watch Video Solution

229. Matrices A and B will be inverse of each other only if

a. AB = BA

b. AB = BA = 0

c. AB = 0, BA = I

d. AB = BA = I

A. AB = BA

B. $AB = BA = O$

C. $AB = O, BA = I$

D. $AB = BA = I$

Answer:

Watch Video Solution

230. Fill in the blanks:

A matrix, in which number of rows is equal to number of columns, is called a ..... Matrix.

Watch Video Solution

231. A matrix which is not a square matrix is called a .... Matrix .

Watch Video Solution

232. Fill in the blanks:

If A is a matrix, then A^2 can be computed only if it is a ..... Matrix.

Watch Video Solution

233. Fill in the blanks:

The negative of a matrix is obtained by multiplying it with the scalar.....

Watch Video Solution

234. Fill in the blanks:

If a matrix A is multiplied by the scalar, 0, then we obtain a ..... Matrix.

Watch Video Solution

235. Fill in the blanks:

If A is a matrix of order $m \times n$, then IA = A where I is the identity matrix of order.....

Watch Video Solution

236. The product of any matrix by the scalar ..... Is the null matrix .

Watch Video Solution

237. Fill in the blanks:

If A is a matrix of order $m \times n$, then IA = A where I is the identity matrix of order.....

Watch Video Solution

238. Fill in the blanks:

Matrix multiplication is ..... Over matrix oaddition.

Watch Video Solution

239. Fill in the blanks:

Matrix multiplication is not..... .

Watch Video Solution

240. Fill in the blanks:

Matrix multiplication is ..... .

Watch Video Solution

241. Fill in the blanks:

If A is any square matrix then AA' is always n ..... matrix.

Watch Video Solution

242. Fill in the blanks:

If A is any square matrix then A-A' is always n ..... matrix.

Watch Video Solution

243. Fill in the blanks:

If a square matrix is both symmetric and skew symmetric then it is a

..... Matrix.

Watch Video Solution

244. If A and B are two skew symmetric matrices of same order, then AB is symmetric matrix if .....

Watch Video Solution

245. If A and B are symmetric matrices of the same order, then show that AB is symmetric if and only if A and B commute, that is AB = BA.

Watch Video Solution

246. Fill in the blanks:

If A,B,C are three matrices such that AB and BC are defined then A (BC)= .....

Watch Video Solution

247. If A is any square matrix then A + A' is a :

Watch Video Solution

248. If A is a skew symmetric matrix, then A^2 is a .....

Watch Video Solution

249. If A is a symmetric matrix , then A^3 is a ..... matrix .

Watch Video Solution

250. Fill in the blanks:

If A is a symmetric matrix then A^2 is a .... Matrix.

Watch Video Solution

251. Fill in the blanks:

If A and B are square matrices of the same order then (AB)' = .../

Watch Video Solution

252. Fill in the blanks:

If A and B are square matrices of the same order then (A+B)' = ...

.

Watch Video Solution

253. Fill in the blanks:

If k is any sclar and A is any matrix, then (k A)' = ...

Watch Video Solution

254. Fill in the blanks:

If k is any sclar and A is any matrix, then [k (A-B)]' = ...

Watch Video Solution

255. If A is skew symmetric , then kA is a .....

Watch Video Solution

256. Fill in the blanks:

If A is a symmetric matrix of order n and B is any square matrix of the same order then B'AB is a ..... Matrix.

Watch Video Solution

257. Fill in the blanks:

If A and B are symmetric matrices of the same order than AB + BA is a ..... matrix.

Watch Video Solution

258. Fill in the blanks:

If A and B are symmetric matrices of the same order than AB - BA is a ..... matrix.

Watch Video Solution

259. If A and B are square matrices of the same order, then $(A+B)(A-B)$ is equal to

Watch Video Solution

260. Fill in the blanks:

If A and B are matrices of the same order than (3 A - 2B)' is equal to ..... .

Watch Video Solution

261. Fill in the blanks:

If A and B are symmetric matrices of the same order then BA - 2 AB is ..... .

Watch Video Solution

262. Fill in the blanks:

If A and B are two matrices then A + B is defined only if these are of the ..... order.

Watch Video Solution

263. Fill in the blanks:

If A is a square matrix of order n and there exists a square matrix B of order n such that $AB = I_n = BA$, then A is an ..... Matrix.

Watch Video Solution

264. Fill in the blanks:

In applying one or more row operations while finding A^{-1} by elementry row operations, if we obtain all zeros in one or more rows, then A^{-1}. . . . . .

Watch Video Solution

265. Addition is commutative for

Watch Video Solution

266. A matrix denotes a number

Watch Video Solution

267. True or False statements :

Matrix addition is not associative.

Watch Video Solution

268. True or False statements :

Subtraction of matrice is commutative.

Watch Video Solution

269. Matrix subtraction is associative

Watch Video Solution

270. If two matrices A and B are of the same order, then $2A + B = B + 2A$.

Watch Video Solution

271. Two matrices are equal if they have same number of rows and same number of columns .

Watch Video Solution

272. True or False statements :

Two matrices are said to be comparable if they are of the same order.

Watch Video Solution

273. Matrix multiplication is commutative .

Watch Video Solution

274. True or False statements :

If A and B are non-zero square matrices of the same order then AB is also a non-zero matrix.

Watch Video Solution

275. If matrix AB=O, then A=O or B=O or both A and B are null matrices .

Watch Video Solution

276. True or False statements :

If A,B,C are three matrices such that both AB and AC are defined and are equal, then it implies that B and C are equal matrices.

Watch Video Solution

277. True or False statements :

Matrix multiplication is associative.

Watch Video Solution

278. True or False statements :

A square matrix in which every element is unity, is called an identity matrix.

Watch Video Solution

279. True or False statements :

In an identity matrix, every non-diagonal element is zero.

Watch Video Solution

280. True or False statements :

In an diagonal matrix, every non-diagonal entry is zero.

Watch Video Solution

281. True or False statements :

In a scalar matrix, all the non-diagonal entries are equal.

Watch Video Solution

282. True or False statements :

Transpose of a column matrix is a column matrix.

Watch Video Solution

283. True or False statements :

Transpose of a row matrix is a column matrix.

Watch Video Solution

284. If A, B and C are square matrices of same order, then AB=AC always implies that B=C .

Watch Video Solution

285. True or False statements :

For a non-singular matrix A, $(A')^{-1} = (A^{-1})'$.

Watch Video Solution

286. If A and B are symmetric matrices of same order then $AB + BA$ is a :

Watch Video Solution

287. True or False statements :

If A is any matrix, then AA' is always a symmetric matrix.

Watch Video Solution

288. True or False statements :

If A is any matrix, then AA' is always a symmetric matrix.

Watch Video Solution

289. True or False statements :

If A is any square matrix, then $\frac{A+A'}{2}$ is always skew-symmetric.

Watch Video Solution

290. True or False statements :

If A is any square matrix, then $\frac{A-A'}{2}$ is always symmetric.

Watch Video Solution

291. If A is a skew symmetric matrix, then A^2 is a .....

Watch Video Solution

292. True or False statements :

If A and B are invertible matrices then AB is invertible and $(AB)^{-1} = B^{-1}A^{-1}$

Watch Video Solution

293. True or False statements :

If and B are invertible matrices such that AB = BA, then $(AB)^{-1} = A^{-1}B^{-1}$

Watch Video Solution

294. True or False statements :

If A and B are invertible matrices of he same order than A + B is also

invertible.

Watch Video Solution

295. If (AB)=B'A' , where A and B are not square matrices, then number of rows in A is equal to number of column in B and number of columns in A is equal to number of rows in B .

Watch Video Solution

296. True or False statements :

Sum of three symmetric matrices of the same order is always symmetric.

Watch Video Solution

297. If A and B are two square matrices of the same order, then $A+B=B+A$.

Watch Video Solution

298. True or False statements :

if A and B are square matrices of the same order then A - B = B - A.

Watch Video Solution

299. True or False statements :

Matrices of different types cannot be subtracted.

Watch Video Solution

300. If $A = \begin{bmatrix} 2 & 3 & -1 \\ 1 & 4 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$, then AB and BA are defined and equal .

Watch Video Solution

301. If A and B are symmetric matrices of same order then $AB - BA$ is a :

Watch Video Solution

302. Prove that any square matrix can be expressed as sum of symmetric and skew symmetric matrix uniquely

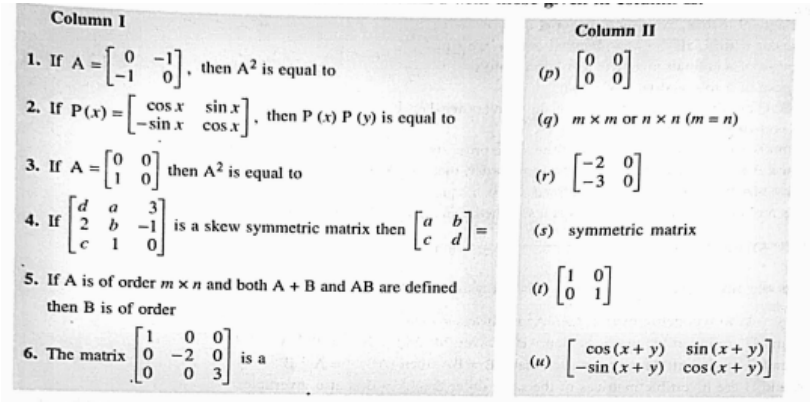
Watch Video Solution

303. True or False statements :

Every diagonal entry of a skew-symmetric matrix is non-zero.

Watch Video Solution

304. Match the following



Column I	Column II
1. If $A=\begin{bmatrix}0 & -1\\ -1 & 0\end{bmatrix}$, then A^2 is equal to	(p) $\begin{bmatrix}0 & 0\\ 0 & 0\end{bmatrix}$
2. If $P(x)=\begin{bmatrix}\cos x & \sin x\\ -\sin x & \cos x\end{bmatrix}$, then $P(x)\,P(y)$ is equal to	(q) $m \times m$ or $n \times n$ $(m=n)$
3. If $A=\begin{bmatrix}0 & 0\\ 1 & 0\end{bmatrix}$ then A^2 is equal to	(r) $\begin{bmatrix}-2 & 0\\ -3 & 0\end{bmatrix}$
4. If $\begin{bmatrix}d & a & 3\\ 2 & b & -1\\ c & 1 & 0\end{bmatrix}$ is a skew symmetric matrix then $\begin{bmatrix}a & b\\ c & d\end{bmatrix}=$	(s) symmetric matrix
5. If A is of order $m \times n$ and both A + B and AB are defined then B is of order	(t) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$
6. The matrix $\begin{bmatrix}1 & 0 & 0\\ 0 & -2 & 0\\ 0 & 0 & 3\end{bmatrix}$ is a	(u) $\begin{bmatrix}\cos(x+y) & \sin(x+y)\\ -\sin(x+y) & \cos(x+y)\end{bmatrix}$

Watch Video Solution

305. Let A be a 5×7 matrix, then each column of A contains

A. 7 elements

B. 5 elements

C. 35 elements

D. none of these

Answer:

Watch Video Solution

306. If matrix A is of order 4×3, then each row of matrix A contains elements :

A. 12 elements

B. 4 elements

C. 3 elements

D. none of these

Answer:

Watch Video Solution

307. The numner of all possible matrices of order 2×3 with each entry 0 or 1 is

A. 64

B. 12

C. 36

D. none of these

Answer:

Watch Video Solution

308. The matrix $A = \begin{bmatrix} 0 & 0 & 6 \\ 0 & 6 & 0 \\ 6 & 0 & 0 \end{bmatrix}$ is a

A. scalar

B. diagonal matrix

C. unit matrix

D. square matrix

Answer:

Watch Video Solution

309. The number of all possible matrices of order 3×3 with each element 0 or 2 is :

A. 0

B. 27

C. 81

D. 512

Answer:

Watch Video Solution

310. If $\begin{bmatrix} 2x+y & 4x \\ 5x-7 & 4x \end{bmatrix} = \begin{bmatrix} 7 & 7y-13 \\ y & x+6 \end{bmatrix}$, then the values of x,y are

A. x = 3, y = 1

B. x = 2, y = 3

C. x = 2, y = 4

D. x = 3, y = 3

Answer:

Watch Video Solution

311. If $\lambda \in R$, then λI_2 is the matrix

A. $\begin{bmatrix} \lambda & \lambda \\ 0 & 0 \end{bmatrix}$

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

C. $\begin{bmatrix} 0 & \lambda \\ \lambda & 0 \end{bmatrix}$

D. $\begin{bmatrix} \lambda & 0 \\ 0 & \lambda \end{bmatrix}$

Answer:

Watch Video Solution

312. If A is of order $m \times n$, B is of order $p \times q$ such that AB is defined, then:

A. m = q

B. m = p

C. n = p

D. n = q

Answer:

Watch Video Solution

313. If P is of order 2×3 and Q is of order 3×2, then PQ is of order

A. 2×3

B. 2×2

C. 3×2

D. 3×3

Answer:

Watch Video Solution

314. If A and B are square matrices of the same order, then $(A + B)(A - B)$ is equal to

A. $A^2 - B^2$

B. $A^2 - BA - AB - AB^2$

C. $A^2 - B^2 + BA - AB$

D. $A^2 - BA + B^2 + AB$

Answer:

Watch Video Solution

315. If $A = \begin{bmatrix} 2 & -1 & 3 \\ -4 & 5 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 4 & -2 \\ 1 & 5 \end{bmatrix}$, then

A. only AB is defined

B. only BA is defined

C. both AB and BA are defined

D. both AB and BA are defined and AB = BA

Answer:

Watch Video Solution

316. If A is 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

Answer:

Watch Video Solution

317. If $A = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ then A^2 is equal to

A. $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$

C. $\begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$

Answer:

Watch Video Solution

318. If $|x\pi| \leq 1, A = \frac{1}{\pi}\begin{bmatrix} \sin^{-1}(x\pi) & \tan^{-1}\left(\frac{x}{\pi}\right) \\ \sin^{-1}\left(\frac{x}{\pi}\right) & \cot^{-1}(x\pi) \end{bmatrix}$ and $B = \frac{1}{\pi}\begin{bmatrix} -\cos^{-1}(x\pi) & \tan^{-1}\left(\frac{x}{\pi}\right) \\ \sin^{-1}\left(\frac{x}{\pi}\right) & -\tan^{-1}(x\pi) \end{bmatrix}$ then A - B is equal to

A. I

B. O

C. $2I$

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

Answer:

Watch Video Solution

319. The matrix $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 4 \end{bmatrix}$ is a

A. identity matrix

B. Symmetric matrix

C. skew-symmetric matrix

D. none of these

Answer:

Watch Video Solution

320. If A is a square matrix, then A is symmetric iff

A. $A^2 = A$

B. $A^2 = I$

C. $A^t = A$

D. $A^t = -A$

Answer:

Watch Video Solution

321. If A is a square matrix, then A is skew symmetric iff

A. $A^2 = A$

B. $A^2 = I$

C. $A^t = A$

D. $A^t = -A$

Answer:

Watch Video Solution

322. If A and B are two matrices of the order $3 \times m$ and $3 \times n$ respectively and m = n, then the order of the matrix 2 A - 5 B is

A. $m \times 3$

B. 3×3

C. $3 \times n$

D. $m \times n$

Answer:

Watch Video Solution

323. The matrix $\begin{bmatrix} 0 & -1 & 8 \\ 1 & 0 & 12 \\ -8 & -12 & 0 \end{bmatrix}$ is a

A. diagonal matrix

B. Symmetric matrix

C. scalar matrix

D. skew-symmetric matrix.

Answer:

Watch Video Solution

324. If A is any square matrix, then

A. $A + A^t$ is skew symmetric

B. $A - A^t$ is symmetric

C. $A + A^t$ is symmetric

D. none of these

Answer:

Watch Video Solution

325. If A and B are symmetric matrices of the same order, then

A. AB is a symmetric matrix

B. A - B is a skew-symmetric matrix

C. AB + BA is a symmetric matrix.

D. AB - BA is a symmetric matrix.

Answer:

Watch Video Solution

326. If A and B are two skew symmetric matrices of same order, then AB is symmetric matrix if .....

A. AB is symmetric

B. AB + BA is symmetric

C. AB - BA is symmetric

D. none of these

Answer:

Watch Video Solution

327. If A is a matrix of order $m \times n$ and B is a matix such that AB' and B'A are both defined, then order of matrix B is

A. $m \times n$

B. $n \times n$

C. $n \times m$

D. $m \times n$

Answer:

Watch Video Solution

328. Each diagonal element of a skew symmetric matrix is

A. zero

B. positive

C. negative

D. non-real

Answer:

Watch Video Solution

329. show that $\begin{bmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{bmatrix} = A$ is nilpotent matrix of order 3.

A. idempotent

B. nilpotent

C. symmetric

D. skew-symmetric matrix.

Answer:

Watch Video Solution

330. If A and B are two matrices such that both A+B and AB are defined, then

A. A and B can be any tow matrices

B. A and B are square matrices nto necessarily of the same order.

C. A and B are square matrices of the same order

D. number of columns of A = number of rows of B.

Answer:

Watch Video Solution

331. 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. $\frac{1}{3}[(2, 1).(1, 2)]$

C. $\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$

D. none of these

Answer:

Watch Video Solution

332. 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. $\begin{bmatrix} 2 & 1 \\ 2 & 0 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 1 \\ 1 & 0 \end{bmatrix}$

D. $\begin{bmatrix} 8 & 4 \\ 8 & 0 \end{bmatrix}$

Answer:

Watch Video Solution

333. If A and B are symmetric matrices of the same order, then

A. null matrix

B. unit matrix

C. skew-symmetric matrix

D. symmetric matrix

Answer:

Watch Video Solution

334. If A and B are any two matrics then

A. Both AB and BA are defined

B. AB is defined but BA is not defined

C. BA is defined but AB is not defined

D. Neither of AB and BA may be defined.

Answer:

Watch Video Solution

335. The matrix $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ is an

A. unit matrix

B. null matrix

C. symmetric matrix

D. skew-symmetric matrix.

Answer: