VAISHALI EDUCATION POINT

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MATRICES

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Class :- XII **Subject :- MATH**

General Instructions

QNo.	Questions
1	If $A=\begin{bmatrix}1 & 4\\ 3 & 2\\ 2 & 5\end{bmatrix}$ and $B=\begin{bmatrix}-1 & 2\\ 0 & 5\\ 3 & 1\end{bmatrix}$ then find the matrix X for which A + B – X = 0
2	If $A=\begin{bmatrix}1 & 2 & 0\\ -7 & 2 & 6\end{bmatrix}$, $B=\begin{bmatrix}6 & 9 & 5\\ -3 & 2 & 7\end{bmatrix}$ and $C=\begin{bmatrix}4 & 3 & 2\\ 0 & 0 & 1\end{bmatrix}$, then show that (A + B) + C = A + (B + C).
3	If $A=\begin{bmatrix}-1 & 3 & 5\\ 1 & -3 & -5\\ -1 & 3 & 5\end{bmatrix}$ then show that $A^2 = A$.
4	Find a single matrix expressing $\frac{1}{2}\begin{bmatrix}1 & 3\\ 1 & -4\end{bmatrix}-\frac{1}{2}\begin{bmatrix}8 & 4\\ 4 & 8\end{bmatrix}$.
5	Given that $A=\begin{bmatrix}1 & a\\ 0 & 1\end{bmatrix}$, show by induction , $A^n=\begin{bmatrix}1 & na\\ 0 & 1\end{bmatrix}$.
6	If $A=\begin{bmatrix}1 & -1\\ 2 & 3\end{bmatrix}$, $B=\begin{bmatrix}2 & 1\\ 1 & 0\end{bmatrix}$, verify that $(A+B)^2 = A^2 + B^2 + 2AB$.
7	If $A=\begin{bmatrix}1 & 0 & 2\\ 0 & 2 & 1\\ 2 & 0 & 3\end{bmatrix}$ Prove that $A^3 - 6A^2 + 7A + 2I = 0$
8	Show that the matrix $A=\begin{bmatrix}1 & 2 & 3\\ 2 & 4 & 6\\ 3 & 6 & 5\end{bmatrix}$ is a symmetric matrix.
9	Show that $A=\begin{bmatrix}0 & 2 & 3\\ -2 & 0 & -4\\ -3 & 4 & 0\end{bmatrix}$ is a skew symmetric matrix.
10	Express the matrices as the sum of a symmetric and a skew symmetric matrix. $\begin{bmatrix}3 & 5\\ 1 & -1\end{bmatrix}$
11	Express the matrices as the sum of a symmetric and a skew symmetric matrix $\begin{bmatrix}6 & -2 & 2\\ -2 & 3 & -1\\ 2 & -1 & 3\end{bmatrix}$.
12	If $A=\begin{bmatrix}2 & 3\\ 4 & 6\end{bmatrix}$, verify that :A + A' is a symmetric matrix
13	If $A=\begin{bmatrix}2 & 3\\ 4 & 6\end{bmatrix}$, verify that : A – A' is a skew symmetric matrix.

14 If $A = \begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \\ 9 & 1 & 0 \end{bmatrix}$, verify that: A + A' is a symmetric matrix

15 In the matrix $A = \begin{bmatrix} 2 & 5 & 19 & -7 \\ 35 & -2 & \frac{5}{2} & 12 \\ \sqrt{3} & 1 & -5 & 17 \end{bmatrix}$, write: (i) The order of the matrix (ii) The number of elements, (iii) Write the elements a_{13}, a_{21}, a_{33}, a_{24}, a_{23}

16 If a matrix has 24 elements, what are the possible order it can have? What, if it has 13 elements?

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

18 Construct a 3 × 4 matrix, whose elements are given by (i) $a_{ij} = \frac{1}{2}|-3i + j|$ (ii) $a_{ij} = 2i - j$

19 Find the value of x, y, and z from the following equation:

(i) $\begin{bmatrix} 4 & 3 \\ x & 5 \end{bmatrix} = \begin{bmatrix} y & z \\ 1 & 5 \end{bmatrix}$ (ii) $\begin{bmatrix} x+y & 2 \\ 5+z & xy \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 5 & 8 \end{bmatrix}$

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

20 Find the value of a, b, c, and d from the equation:

$$\begin{bmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{bmatrix} = \begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$$

21 $A = [a_{ij}]_{m \times n}$ is a square matrix, if (A) m < n (B) m > n (C) m = n (D) None of these

22 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) $x = \frac{-1}{3}, y = \frac{-2}{3}$

23 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

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 each of the following (i) A+B (ii) A-B (iii) 3A-C (iv) AB (v) BA

25 Compute the following:

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

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

(v) $\begin{bmatrix} \cos^2 x & \sin^2 x \\ \sin^2 x & \cos^2 x \end{bmatrix} + \begin{bmatrix} \sin^2 x & \cos^2 x \\ \cos^2 x & \sin^2 x \end{bmatrix}$

26 Compute the indicated products

(i) $\begin{bmatrix} a & b \\ -b & a \end{bmatrix}\begin{bmatrix} a & -b \\ b & a \end{bmatrix}$

(ii) $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}\begin{bmatrix} 2 & 3 & 4 \end{bmatrix}$

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

(iv) $\begin{bmatrix} 2 & 3 & 4 \\ 3 & 4 & 5 \\ 4 & 5 & 6 \end{bmatrix}\begin{bmatrix} 1 & -3 & 5 \\ 0 & 2 & 4 \\ 3 & 0 & 5 \end{bmatrix}$

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

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

27 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 (A-B). Also, verify that A+(B-C)=(A+B)-C.

28 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.

29 Simplify $\cos\theta\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix} + \sin\theta\begin{bmatrix} \sin\theta & -\cos\theta \\ \cos\theta & \sin\theta \end{bmatrix}$

30 Find X and Y, if (i) $X + Y = \begin{bmatrix} 7 & 0 \\ 2 & 5 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

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

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

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

33 Solve the equation for x, y, z and t if

$$2\begin{bmatrix}x & z\\ y & t\end{bmatrix}+3\begin{bmatrix}1 & -1\\ 0 & 2\end{bmatrix}=3\begin{bmatrix}3 & 5\\ 4 & 6\end{bmatrix}$$

34 If $x\begin{bmatrix}2\\ 3\end{bmatrix}+y\begin{bmatrix}-1\\ 1\end{bmatrix}=\begin{bmatrix}10\\ 5\end{bmatrix}$, find values of x and y.

35 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

36 If $F(x)=\begin{bmatrix}\cos x & -\sin x & 0\\ \sin x & \cos x & 0\\ 0 & 0 & 1\end{bmatrix}$, show that $F(x)F(y)=F(x+y)$

37 Show that (i) $\begin{bmatrix}5 & -1\\ 6 & 7\end{bmatrix}\begin{bmatrix}2 & 1\\ 3 & 4\end{bmatrix}\neq\begin{bmatrix}2 & 1\\ 3 & 4\end{bmatrix}\begin{bmatrix}5 & -1\\ 6 & 7\end{bmatrix}$

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

38 Find $A^2 - 5A + 6I$ if $A=\begin{bmatrix}2 & 0 & 1\\ 2 & 1 & 3\\ 1 & -1 & 0\end{bmatrix}$

39 If $A=\begin{bmatrix}3\\ 5\\ 2\end{bmatrix}$ and $B=[1\ 0\ 4]$ find (AB).

(2007)

40 Find the area of the triangle whose vertices are (2, 7), (1, 1) and (10, 8). **(2007)**

41 If $A=\begin{bmatrix}2 & -3\\ 3 & 4\end{bmatrix}$, show that $A^2 - 6A + 17I = 0$. Hence find. A^{-1} **(2007)**

42 Construct a 2×2 matrix $A=|a_{ij}|$ whose elements are given by . $a_{ij}=\frac{i}{j}$ **(2008 Comp.)**

43 If $\begin{bmatrix}x+2y & -y\\ 3x & 4\end{bmatrix}=\begin{bmatrix}-4 & 3\\ 6 & 4\end{bmatrix}$, find the values of x and y. **(2008 Comp.)**

44 Find the value of x and y if : $2\begin{bmatrix}1 & 3\\ 0 & x\end{bmatrix}+\begin{bmatrix}y & 0\\ 1 & 2\end{bmatrix}=\begin{bmatrix}5 & 6\\ 1 & 8\end{bmatrix}$ **(2008)**

45 Find the co-factor of a_{12} in the following : $\begin{vmatrix}2 & -3 & 5\\ 6 & 0 & 4\\ 1 & 5 & -7\end{vmatrix}$ **(2008)**

46	Let $A=\begin{bmatrix}3 & 2 & 5\\ 4 & 1 & 3\\ 0 & 6 & 7\end{bmatrix}$. Express A as sum of two matrices such that one is symmetric and the other is skew symmetric. OR If $A=\begin{vmatrix}1 & 2 & 2\\ 2 & 1 & 2\\ 2 & 2 & 1\end{vmatrix}$, verify that $A^2 - 4A - 5i$ **(2008)**
47	If $A=\begin{pmatrix}3 & 4\\ 2 & 3\end{pmatrix}$, find A + A', where A' is the transpose of matrix A. **(2009 Comp.)**
48	If $\begin{bmatrix}15 & x+y\\ 2 & y\end{bmatrix}=\begin{bmatrix}15 & 8\\ x-y & 3\end{bmatrix}$, find the value of x. **(2009 Comp.)**
49	If matrix A = (1 2 3), write AA' ; where A' is the transpose of matris A. **(2009)**
50	If $\begin{pmatrix}a+b & 2\\ 5 & b\end{pmatrix}=\begin{pmatrix}6 & 5\\ 2 & 2\end{pmatrix}$, then find a.**(2010 Comp.)**
51	If A is a matrix of order 3 × 4 and B is a matrix of order 4 × 3, find the order of the matrix (AB). **(2010 Comp.)**
52	If $A=\begin{pmatrix}3 & 1\\ 2 & -3\end{pmatrix}$, then find $\lvert adjA\rvert$ **(2010 Comp.)**
53	If $A=\begin{pmatrix}\cos\alpha & -\sin\alpha\\ \sin\alpha & \cos\alpha\end{pmatrix}$, then for what value of α is A an identity matrix ? **(2010)**
54	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. **(2010)**
55	Using elementary row operations, find the inverse of the following matrix: $\begin{pmatrix}2 & 5\\ 1 & 3\end{pmatrix}$ **(2010)**
56	For what value of x is the matrix $\begin{bmatrix}6-x & 4\\ 3-x & 1\end{bmatrix}$ singular? **(2011 Comp.)**
57	If $\begin{bmatrix}x & x-y\\ 2x+y & 7\end{bmatrix}=\begin{bmatrix}3 & 1\\ 8 & 7\end{bmatrix}$, then find the value of y. **(2011 Comp.)**
58	For a 2 × 2 matrix, $A=[a_{ij}]$, whose elements are given by $a_{ij}=\frac{i}{j}$ write the value of a_{12}. **(2011)**
59	For what value of x, the matrix $\begin{bmatrix}5-x & x+1\\ 2 & 4\end{bmatrix}$ is singular? **(2011)**
60	Using elementary transformations, find the inverse of the matrix. $\begin{pmatrix}1 & 3 & -2\\ -3 & 0 & -1\\ 2 & 1 & 0\end{pmatrix}$ **(2011)**
61	Construct a 2 × 2 matrix A = $[a_{ij}]$, where $a_{ij}=\frac{(3i-j)^2}{2}$.
62	If a matrix has 8 elements, list the possible orders of a matrix.
63	Construct a 3 × 1 matrix A = $[a_{ij}]$ whose elements a_{ij} are given by, $a_{ij}=\frac{1}{2}\lvert -3i+j\rvert$

64 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, of order 3×2 such that $2A + 3X = 5B$.

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

66 If A and B are symmetric matrices of the same order, then show that AB – BA is a skew- symmetric matrix.

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

68 Find x and y, if $\begin{pmatrix}x\\ 2y\end{pmatrix}+\begin{pmatrix}-1\\ 4\end{pmatrix}=\begin{pmatrix}0\\ 3\end{pmatrix}$.

69 If $A=\begin{bmatrix}1\\ 2\\ 3\end{bmatrix}$, B = [2 –3 4], find AB.

70 If A, B and AB are symmetric matrices, then what is the relation between AB and BA.

71 Find the values of x, y and z, if $\begin{bmatrix}x+y+z\\ x+z\\ y+z\end{bmatrix}=\begin{bmatrix}9\\ 5\\ 7\end{bmatrix}$.

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

73 Represent the matrix $A=\begin{bmatrix}2 & -1\\ 4 & 2\end{bmatrix}$ as a sum of symmetric and skew-symmetric matrix.

74 Find matrices A and B for the following: $A+B=\begin{bmatrix}1 & 2\\ 3 & 4\end{bmatrix}$; $2A+3B=\begin{bmatrix}5 & 6\\ 7 & 8\end{bmatrix}$.

75 Find the values of p and q such that $A^2 + pI = qA$, where $A=\begin{bmatrix}3 & 1\\ 7 & 5\end{bmatrix}$

76 If $A=\begin{bmatrix}1 & 6 & 9\\ 2 & 1 & 5\end{bmatrix}^T$ and $B=\begin{bmatrix}9 & 3 & 8\\ 0 & 5 & -11\end{bmatrix}$, verify that (AB)' = B'A'.

77 Find the values of a, b, c, d from the following : $\begin{bmatrix}2a+b & a-2b\\ 5c-d & 4c+3d\end{bmatrix}=\begin{bmatrix}4 & -3\\ 11 & 24\end{bmatrix}$.

78 If $A=\begin{bmatrix}-2\\ 4\\ 5\end{bmatrix}$ and B = [1 3 –6], verify that (BA)' = A'B'.

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

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

81	Express the matrix $\begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{bmatrix}$ as a sum of symmetric and a skew-symmetric matrix.
82	Find x, if [x –5 –1] . $\begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix} \begin{bmatrix} x \\ 4 \\ 1 \end{bmatrix} = 0$
83	If $A = \begin{bmatrix} 0 & -\tan\frac{\alpha}{2} \\ \tan\frac{\alpha}{2} & 0 \end{bmatrix}$ and I is the identity matrix of order 2, show that I + A = (I – A) $\begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$.
84	If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$, then prove that $A^n = \begin{bmatrix} \cos n\theta & \sin n\theta \\ -\sin n\theta & \cos n\theta \end{bmatrix}$, for $n \in N$.
85	If $A' = \begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 0 \\ 1 & 2 \end{bmatrix}$, find (A + 2B)'.
86	Find the matrix X such that, $\begin{bmatrix} 2 & -1 \\ 0 & 1 \\ -2 & 4 \end{bmatrix} X = \begin{bmatrix} -1 & -8 & -10 \\ 3 & 4 & 0 \\ 10 & 20 & 10 \end{bmatrix}$.
87	If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$, then prove that for n ∈ N, $A^n = \begin{bmatrix} \cos n\theta & \sin n\theta \\ -\sin n\theta & \cos n\theta \end{bmatrix}$.
88	Using elementary transformations, find the inverse of the following matrix: $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 5 & 7 \\ -2 & -4 & -5 \end{bmatrix}$.
89	Find the inverse using elementary transformation, if exists, for the matrix $\begin{bmatrix} 8 & -4 \\ -2 & 1 \end{bmatrix}$.
90	If $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$, prove that $A^n = \begin{bmatrix} 3^{n-1} & 3^{n-1} & 3^{n-1} \\ 3^{n-1} & 3^{n-1} & 3^{n-1} \\ 3^{n-1} & 3^{n-1} & 3^{n-1} \end{bmatrix}$, for n ∈ N.
91	Find the inverse of matrix $\begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ using elementary transformations.
92	If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, show that $A^2 - 5A + 7I = 0$, use the result to find A^4.
93	If $A = \begin{pmatrix} -1 & 1 & -1 \\ 3 & -3 & 3 \\ 5 & -5 & 5 \end{pmatrix}$ and $B = \begin{pmatrix} 0 & 4 & 3 \\ 1 & -3 & -3 \\ -1 & 4 & 4 \end{pmatrix}$, compute A^2B^2.
94	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, find how to divide Rs. 30,000 among two types of bonds, if the trust fund must obtain an annual total

	interest of (i) Rs. 1,800 (ii) Rs. 2,000.
95	Let $A=\begin{bmatrix}0 & 1\\ 0 & 0\end{bmatrix}$, show that $(aI+bA)^n = a^nI+na^{n-1}bA$, where I is the identity matrix of order 2 and $n \in N$.
96	If $\begin{bmatrix}x & 3x-y\\ 2x+z & 3y-w\end{bmatrix}=\begin{bmatrix}3 & 2\\ 4 & 7\end{bmatrix}$, find x, y, z, w.