INDIAN SCHOOL AL WADI AL KABIR

Class XII, Mathematics ***Worksheet 3***

Matrices & Determinants

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Q.1.	Total number of possible matrices of order 3x3 with each entry 2 or 0 is							
	A	9	B	27	C	81	D	512
Q.2.	Which of he 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	x= $\frac{-2}{3}$, y = 7	C	x= $\frac{-7}{3}$, y= $\frac{-2}{3}$	D	Not possible to find
Q.3.	If A and B are two matrices of order 3 x m and 3 x n respectively and m = n, then the order of Matrix (5A – 2B) is							
	A	m x 3	B	3 x n	*C*	n x 3	D	m x n
Q.4.	Given A = $\begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ and $A^2 = 3I$, then							
	A	$1+\alpha^2+\beta\gamma = 0$	B	$1 - \alpha^2 - \beta\gamma = 0$	C	$3 - \alpha^2 - \beta\gamma = 0$	D	$3+\alpha^2+\beta\gamma = 0$
Q.5.	If A and B are square matrices of the same order and AB = 3I, then A^{-1} is equal to							
	A	3A	B	$\frac{1}{3}$ B	*C*	3 B^{-1}	D	$\frac{1}{3}$ B^{-1}
Q.6.	If A is an invertible matrix of order 2, then det(A^{-1}) is equal to							
	A	det(A)	B	$\frac{1}{\det(A)}$	*C*	1	D	0
Q.7.	If A and B are invertible matrices, then which of the following is not correct?							
	A	adj(A)=$\|A\|$.A^{-1}	B	$\det(A)^{-1} = [\det(A)]^{-1}$	*C*	$(AB)^{-1} = B^{-1} A^{-1}$	D	$(A+B)^{-1} = B^{-1} + A^{-1}$
	Very short answer type questions							
Q8.	If x ∈ N and $\begin{vmatrix} x+3 & -2 \\ -3x & 2x \end{vmatrix}$=8, then find the value of x							
Q9.	If A is a 3x3 invertible matrix, then what will be the value of k, if det (A^{-1}) = $[\det(A)]^k$							
Q10.	If A_{ij} is the cofactor of the a_{ij} of the determinant $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$, then find a_{32} . A_{32}							

Q11.	If the value of a third order determinant is 12, then find the value of determinant formed by replacing each element by its co-factor.
	Short answer type questions
Q12.	If A= $\begin{bmatrix} 3 & -2 \\ 4 & -2 \end{bmatrix}$, then find the value of λ so that $A^2 = \lambda A - 2I$. Hence find A^{-1}
Q13.	Show that A = $\begin{bmatrix} 2 & -3 \\ 3 & 4 \end{bmatrix}$ satisfies the equation x2 – 6x + 17 = 0. Hence, find A^{-1}
Q14.	Given, A = $\begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$, compute C and show that 2 A^{-1} = 9I - A
Q15.	If A = $\begin{bmatrix} 1 & tanx \\ -tanx & 1 \end{bmatrix}$, then show that $A^T A^{-1}$ = = $\begin{bmatrix} cos2x & -sin2x \\ sin2x & cos2x \end{bmatrix}$
Q16.	Express the matrix A= $\begin{bmatrix} 2 & 4 & -6 \\ 7 & 3 & 5 \\ 1 & -2 & 4 \end{bmatrix}$ as the sum of a symmetric and skew-symmetric matrices.
	Long answer type questions
Q17.	If A= $\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$, then prove that $A^2 - 4A - 5I = 0$. Hence find A^{-1}
Q18.	If A= $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 0 & 2 \\ 3 & 1 & 1 \end{bmatrix}$, find A^{-1}. Hence solve the system of equation x +y +z = 6, x + 2z = 7 and 3x + y + z = 12
Q19.	Use product $\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix} \begin{bmatrix} -2 & 0 & 1 \\ 9 & 2 & -3 \\ 6 & 1 & -2 \end{bmatrix}$ to solve the system of equation x + 3z = 9, -x + 2y -2z = 12 and 2x -3y + 4z = 3
Q20.	If A= $\begin{bmatrix} 2 & 3 & 10 \\ 4 & -6 & 5 \\ 6 & 9 & -20 \end{bmatrix}$, then find A^{-1}. Using A^{-1} solve the set of equations $\frac{2}{x} + \frac{3}{y} + \frac{10}{z} = 2$, $\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 5$ and $\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = -4$.

ANSWERS	1.	D	2.	D	3.	B	4.	C
	5.	B	6.	B	7.	D	8.	X=2
	9.	K= -1	10	110	11	144	12	λ=1; A=$\begin{bmatrix}-1 & 1\\-2 & -3/2\end{bmatrix}$
	13	$A^{-1} = \frac{1}{7}\begin{bmatrix}2 & -1\\1 & 3\end{bmatrix}$	14		15		16	
	17	$A^{-1} = \frac{1}{5}\begin{bmatrix}-3 & 2 & 2\\2 & -3 & 2\\2 & 2 & -3\end{bmatrix}$	18	x=3, y=1, z=2	19	x=36, y=11, z=-9	20	x=2, y= -3, z=2

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