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MATHEMATICS TEST - CHAPTER 2: MATRICES AND DETERMINANTS

Name:		Roll No.		Section:

Total Time: 3:20 Hour
Time Allowed: 200 Minutes

Total Marks: 200

PAPER OBJECTIVE
SECTION-A (MARKS 200)

NOTE: Section-A is compulsory. All parts of this section are to be answered on these pages and handed over to the center superintendent. Deleting / overwriting is not allowed. Do not use lead pencil.

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

Questions	A	B	C	D	A B C D
1. A matrix is an array of numbers arranged in:	horizontal and vertical lines enclosed in square brackets	only diagonal lines	only one vertical line	a single circle	●○○○
2. The horizontal lines of a matrix are known as its:	entries only	columns	diagonals	rows	○○○●
3. The vertical lines of a matrix are known as its:	rows	columns	diagonals	orders	○●○○
4. Matrices are usually denoted by:	numbers only	Greek letters only	capital letters	small letters only	○○●○
5. Each number in a matrix is called an:	element or entry	order	exponent	determinant	●○○○
6. In the notation a_{ij}, the subscript i denotes the:	determinant	column number	row number	order	○○●○
7. In the notation a_{ij}, the subscript j denotes the:	row number	column number	rank	order	○●○○
8. The element lying in the second row and third column of a matrix is denoted by:	a_{23}	a_{32}	a_{22}	a_{33}	●○○○
9. The order of a matrix with m rows and n columns is:	m × n	m + n	n × m	m − n	●○○○
10. In stating the order of a matrix, we always write the number of:	elements first	diagonals first	columns first and then rows	rows first and then columns	○○○●
11. The total number of elements in a matrix of order 2 × 3 is:	6	8	9	5	●○○○
12. The total number of elements in a matrix of order 4 × 5 is:	9	25	16	20	○○○●
13. Two matrices are equal if and only if they have:	the same determinant only	the same trace only	the same order and the same corresponding elements	the same number of rows only	○○●○
14. A matrix having only one row is called a:	zero matrix	row matrix (row vector)	column matrix	square matrix	○●○○

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Questions	A	B	C	D	A B C D
15. A matrix having only one column is called a:	row matrix	column matrix (column vector)	diagonal matrix	square matrix	○●○○
16. A matrix having equal numbers of rows and columns is called a:	column matrix	rectangular matrix	square matrix	row matrix	○○●○
17. A matrix whose number of rows is not equal to its number of columns is called a:	rectangular matrix	square matrix	identity matrix	scalar matrix	●○○○
18. A matrix all of whose elements are zero is called a:	identity matrix	zero (null) matrix	scalar matrix	unit matrix	○●○○
19. A square matrix in which all elements except the main diagonal are zero (with at least one non-zero diagonal element) is called a:	rectangular matrix	diagonal matrix	row matrix	zero matrix	○●○○
20. A diagonal matrix in which all diagonal elements are equal and non-zero is called a:	row matrix	scalar matrix	triangular matrix	zero matrix	○●○○
21. A scalar matrix whose diagonal elements are all equal to 1 is called an:	identity (unit) matrix	rectangular matrix	zero matrix	row matrix	●○○○
22. A square matrix with all elements below the main diagonal equal to zero is called an:	upper triangular matrix	symmetric matrix	lower triangular matrix	diagonal matrix	●○○○
23. A square matrix with all elements above the main diagonal equal to zero is called a:	scalar matrix	upper triangular matrix	lower triangular matrix	identity matrix	○○●○
24. A square matrix that is either upper triangular or lower triangular is called a:	symmetric matrix	diagonal matrix only	triangular matrix	scalar matrix only	○○●○
25. The matrix [3 0; 0 3] is a:	row matrix	scalar matrix	zero matrix	rectangular matrix	○●○○
26. The matrix [1 0; 0 1] is the:	row matrix	scalar matrix with k = 0	zero matrix of order 2	identity matrix of order 2	○○○●
27. The matrix [2 0; 0 5] is a:	zero matrix	identity matrix	diagonal matrix but not a scalar matrix	scalar matrix	○○●○
28. The order of the matrix [2 1 6 8] is:	4 × 4	2 × 2	4 × 1	1 × 4	○○○●
29. The order of the matrix [3] is:	1 × 3	3 × 1	3 × 3	1 × 1	○○○●
30. The sum, difference and product of two upper triangular matrices of the same order is:	a scalar matrix always	an upper triangular matrix	a lower triangular matrix	a diagonal matrix always	○●○○
31. The matrix obtained by interchanging rows and columns of a matrix A is called its:	adjoint	cofactor matrix	inverse	transpose	○○○●

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Questions	A	B	C	D	A B C D
32. If A is a matrix of order 3 × 2, the order of its transpose A^t is:	2 × 3	3 × 3	2 × 2	3 × 2	●○○○
33. If A is a square matrix, the order of A and A^t is:	always 2 × 2	different	the same	always 1 × 1	○○●○
34. The transpose of an upper triangular matrix is a:	scalar matrix	zero matrix	upper triangular matrix	lower triangular matrix	○○○●
35. A square matrix A is called symmetric if:	$A = -A^t$	$A = 0$	$A = A^{-1}$	$A = A^t$	○○○●
36. A square matrix A is called skew-symmetric if:	$A = A^{-1}$	$A = A^t$	$A = I$	$A = -A^t$	○○○●
37. In a symmetric matrix, the elements satisfy:	$a_{ij} = a_{ji}$	$a_{ij} = -a_{ji}$	$a_{ij} = a_{ii}$	$a_{ij} = 0$	●○○○
38. In a skew-symmetric matrix, the elements satisfy:	$a_{ij} = -a_{ji}$	$a_{ij} = a_{ii}$	$a_{ij} = a_{ji}$	$a_{ij} = 1$	●○○○
39. All diagonal elements of a skew-symmetric matrix are:	one	negative	zero	equal to each other and non-zero	○○●○
40. The matrix [1 2; 2 3] is:	a row matrix	symmetric	a zero matrix	skew-symmetric	○●○○
41. The matrix [0 2; −2 0] is:	an identity matrix	a diagonal matrix	skew-symmetric	symmetric	○○●○
42. The only matrix that is both symmetric and skew-symmetric is the:	scalar matrix with k = 1	row matrix	zero matrix	identity matrix	○○●○
43. The term "matrix" was introduced in the nineteenth century by the English mathematician:	Arthur Cayley	Carl Gauss	Isaac Newton	James Sylvester	○○○●
44. The algebra of matrices was developed by:	Leonhard Euler	Gabriel Cramer	Arthur Cayley	James Sylvester	○○●○
45. When a phone screen is rotated into landscape form, the pixel matrix is rotated using the:	rank	determinant	inverse	transpose	○○○●
46. The screen of a smart phone or LED TV is essentially a:	pixel matrix	zero matrix	diagonal matrix	scalar matrix	●○○○
47. If k is a non-zero scalar and A = $[a_{ij}]$, then kA is the matrix obtained by:	adding k to every element of A	multiplying only the diagonal by k	multiplying every element of A by k	dividing each element by k	○○●○
48. The value of 3[1 2; 0 −1] is:	[3 6; 0 −3]	[4 5; 3 2]	[3 2; 0 −1]	[1 6; 0 −3]	●○○○

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Questions	A	B	C	D	A B C D
49. Two matrices are conformable for addition if they have:	the same order	the same transpose	the same determinant	the same number of columns only	●○○○
50. The sum of [1 2; 3 4] and [5 6; 7 8] is:	[6 8; 10 11]	[4 4; 4 4]	[5 12; 21 32]	[6 8; 10 12]	○○○●
51. The difference [5 3; 2 1] − [1 1; 1 1] is:	[4 2; 1 1]	[4 2; 1 0]	[5 3; 2 0]	[6 4; 3 2]	○●○○
52. Two matrices A and B are conformable for the product AB if:	the number of rows of A equals the number of rows of B	both are square	both have the same order	the number of columns of A equals the number of rows of B	○○○●
53. If A is of order 2 × 3 and B is of order 3 × 4, the order of AB is:	4 × 2	2 × 4	2 × 3	3 × 3	○●○○
54. If A is of order 3 × 2 and B is of order 2 × 5, the order of AB is:	3 × 5	5 × 3	3 × 2	2 × 2	●○○○
55. If A is of order 2 × 3 and B is of order 3 × 4, then:	BA exists but AB does not	AB exists but BA does not	both AB and BA exist	neither AB nor BA exists	○●○○
56. The product [1 2; 3 4][5 6; 7 8] is:	[19 22; 43 50]	[19 43; 22 50]	[5 12; 21 32]	[6 8; 10 12]	●○○○
57. The product of the row matrix [2 1] and the column matrix [3; 4] is:	[24]	[3 8]	[10]	[6 4]	○○●○
58. For any matrix A of suitable order, AI equals:	A	I	0	A^t	●○○○
59. The element c_{ij} of the product AB is obtained by multiplying the:	jth row of A with the ith column of B	ith row of A with the jth column of B	ith column of A with the jth row of B	ith row of A with the ith row of B	○●○○
60. Matrix addition is:	defined for any two matrices	not commutative	commutative	always equal to multiplication	○○●○
61. In general, matrix multiplication is:	always commutative	always equal to zero	not commutative	only defined for square matrices	○○●○
62. For A = [1 2; 0 1] and B = [1 0; 3 1], the product AB is:	[7 2; 3 1]	[2 2; 3 2]	[1 0; 0 1]	[1 2; 3 7]	●○○○
63. For A = [1 2; 0 1] and B = [1 0; 3 1], the product BA is:	[1 0; 0 1]	[2 2; 3 2]	[1 2; 3 7]	[7 2; 3 1]	○○●○
64. The reversal law for the transpose of a product states that $(AB)^t$ equals:	A^tB^t	BA	B^tA^t	AB	○○●○
65. For matrices of the same order, $(A + B)^t$ equals:	$(AB)^t$	AB^t	$A^t + B^t$	$A^t - B^t$	○○●○

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Questions	A	B	C	D	A B C D
66. For any matrix A, $(A^t)^t$ equals:	A	A^t	A^{-1}	$-A$	●○○○
67. For a scalar k, $(kA)^t$ equals:	k^tA	A^t/k	kA^t	$k + A^t$	○○●○
68. Any square matrix A can be written as the sum of a symmetric matrix P and a skew-symmetric matrix Q, where P equals:	$A + A^t$	$(A + A^t)/2$	$A - A^t$	$(A - A^t)/2$	○●○○
69. In writing A = P + Q with P symmetric and Q skew-symmetric, the matrix Q equals:	$2(A - A^t)$	$(A + A^t)/2$	$A^t - A$	$(A - A^t)/2$	○○○●
70. For A = [1 4; 2 3], the symmetric part $(A + A^t)/2$ is:	[2 6; 6 6]	[1 4; 2 3]	[0 1; −1 0]	[1 3; 3 3]	○○○●
71. For A = [1 4; 2 3], the skew-symmetric part $(A - A^t)/2$ is:	[0 1; −1 0]	[0 −1; 1 0]	[0 2; −2 0]	[1 3; 3 3]	●○○○
72. For A = [1 1; 0 1], the matrix A^2 is:	[1 0; 0 1]	[1 2; 0 1]	[1 1; 0 1]	[2 2; 0 2]	○●○○
73. If AB = B and BA = A, then $A^2 + B^2$ equals:	AB	A + B	0	2AB	○●○○
74. If A = $[a_{ij}]$ is a 3 × 3 matrix with $a_{ij} = i^2 - j^2$, then A is:	the identity matrix	symmetric	skew-symmetric	a scalar matrix	○○●○
75. For a non-singular square matrix A, $(A^{-1})^t$ equals:	$-A$	A	A^tA	$(A^t)^{-1}$	○○○●
76. The determinant is defined only for a:	rectangular matrix	column matrix	square matrix	row matrix	○○●○
77. The determinant of a square matrix A is denoted by:	A^{-1}	adj(A)	det(A^t) only	det(A) or |A|	○○○●
78. The determinant of the matrix [a b; c d] is:	ac − bd	ad + bc	ab − cd	ad − bc	○○○●
79. The value of the determinant of [2 3; 1 4] is:	5	−5	11	8	●○○○
80. The value of the determinant of [3 −2; 1 4] is:	10	−14	12	14	○○○●
81. The value of the determinant of [1 2; 2 4] is:	4	0	8	−8	○●○○
82. A determinant of order 3 can be expanded along any of its:	rows or columns	columns only	diagonals only	rows only	●○○○

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Questions	A	B	C	D	A B C D
83. A determinant of order 3 can be expanded in how many different ways?	3	9	2	6	○○○●
84. The minor of an element a_{ij} is the determinant of the matrix obtained by deleting the:	jth row and ith column	ith row and jth column	diagonal	first row and first column	○●○○
85. The cofactor of an element a_{ij} is given by:	$a_{ij}\, M_{ij}$	M_{ij}/a_{ij}	$(-1)^{i-j}\, a_{ij}$	$(-1)^{i+j}\, M_{ij}$	○○○●
86. The cofactor of the element a_{12} is:	M_{21}	M_{12}	$-M_{21}$	$-M_{12}$	○○○●
87. The cofactor of the element a_{11} is:	M_{11}	0	M_{12}	$-M_{11}$	●○○○
88. The sign pattern of cofactors in a 3 × 3 determinant for the first row is:	+ + +	+ − +	− + −	− − −	○●○○
89. The determinant of a matrix can be evaluated by adding the products of the elements of any row or column with their:	corresponding transposes	corresponding minors	corresponding inverses	corresponding cofactors	○○○●
90. A square matrix A is called singular if:	$A = I$	$\|A\| = 0$	$\|A\| \neq 0$	$A = A^t$	○●○○
91. A square matrix A is called non-singular if:	$\|A\| \neq 0$	$A = 0$	A is a row matrix	$\|A\| = 0$	●○○○
92. Only non-singular matrices have a:	determinant	zero minor	multiplicative inverse	transpose	○○●○
93. The adjoint of a square matrix is the transpose of its:	minor matrix	inverse matrix	cofactor matrix	identity matrix	○○●○
94. The adjoint of the 2 × 2 matrix [a b; c d] is:	[d −b; −c a]	[−d b; c −a]	[d b; c a]	[a −b; −c d]	●○○○
95. The adjoint of [1 2; 3 4] is:	[1 −2; −3 4]	[4 2; 3 1]	[−4 2; 3 −1]	[4 −2; −3 1]	○○○●
96. The inverse of a non-singular matrix A by the adjoint method is:	$A^t/\|A\|$	$\|A\|\ \text{adj}(A)$	$\text{adj}(A^t)$	$\text{adj}(A)/\|A\|$	○○○●
97. The inverse of [1 2; 3 4] is:	[4 −2; −3 1]	[−2 1; 3/2 −1/2]	[2 −1; −3/2 1/2]	[−2 3/2; 1 −1/2]	○●○○
98. The inverse of [2 1; 1 1] is:	[1 1; 1 2]	[1 −1; −1 2]	[−1 1; 1 −2]	[2 −1; −1 1]	○●○○
99. The inverse of [3 0; 0 2] is:	[2 0; 0 3]	[1/3 0; 0 1/2]	[−3 0; 0 −2]	[3 0; 0 2]	○●○○

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Questions	A	B	C	D	A B C D
100. The product of a square matrix A and its inverse A^{-1} is:	A	A^t	the identity matrix	the zero matrix	○○●○
101. The reversal law for inverses states that $(AB)^{-1}$ equals:	AB	$B^{-1}A^{-1}$	$A^{-1}B^{-1}$	$(BA)^{-1}A$	○●○○
102. The inverse of a singular matrix:	always exists	is the zero matrix	is the identity matrix	does not exist	○○○●
103. The product A · adj(A) is equal to:	|A| I	A^{-1}	A	adj(A)	●○○○
104. For which value of k is the matrix [k 2; 4 8] singular?	8	2	4	1	○○○●
105. For which value of k is the matrix [2 k; 3 6] singular?	6	4	2	3	○●○○
106. The determinant of an identity matrix of any order is:	1	the order of the matrix	−1	0	●○○○
107. The value of the determinant of the diagonal matrix with diagonal elements 2, 3, 4 is:	9	1	24	0	○○●○
108. The value of |1 2 3; 0 1 4; 0 0 1| is:	1	−1	6	0	●○○○
109. The determinant of a triangular matrix equals:	the sum of its diagonal elements	zero always	the product of its diagonal elements	one always	○○●○
110. The value of |2 1 3; 0 4 5; 0 0 6| is:	48	0	24	12	●○○○
111. The value of |1 2 3; 4 5 6; 7 8 9| is:	0	−3	9	45	●○○○
112. The value of |1 0 2; 0 1 3; 4 5 6| is:	17	−17	8	−8	○●○○
113. The value of |2 0 1; 1 3 2; 1 1 1| is:	2	4	0	−2	○○●○
114. Property 1 of determinants states that the determinant of a matrix and the determinant of its transpose are:	reciprocals	opposite in sign	unrelated	equal	○○○●
115. If two rows of a determinant are interchanged, the value of the determinant:	doubles	becomes zero	remains unchanged	changes sign	○○○●
116. If two rows (or columns) of a determinant are identical, its value is:	negative one	zero	doubled	one	○●○○

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Questions	A	B	C	D	A B C D
117. If each element of a row is multiplied by a non-zero scalar k, the determinant is:	multiplied by k	equal to zero	unchanged	divided by k	●○○○
118. If all elements of a row or column of a square matrix are zero, then its determinant is:	undefined	zero	one	negative	○●○○
119. If a multiple of one row is added to another row, the value of the determinant:	remains unchanged	changes sign	becomes zero	is multiplied by the scalar	●○○○
120. Which property is used when each element of a row is the sum of two numbers?	The determinant becomes zero	The determinant splits into the sum of two determinants	The determinant doubles	The determinant changes sign	○●○○
121. Without expansion, the value of a determinant having two identical rows is:	zero	one	undefined	the product of the rows	●○○○
122. If A is a 3 × 3 matrix and every element of one row is multiplied by 2, then |A| is:	divided by 2	multiplied by 8	multiplied by 2	unchanged	○○●○
123. For a 3 × 3 matrix A, the determinant |2A| equals:	6|A|	2|A|	8|A|	|A|	○○●○
124. The three elementary row operations are interchanging two rows, multiplying a row by a non-zero scalar and:	adding a multiple of one row to another row	deleting a row	taking the transpose of a row	squaring a row	●○○○
125. Interchanging the ith and jth rows is denoted by:	R_i^t	R_{ij}	kR_i	$R_i + kR_j$	○●○○
126. Multiplying the ith row by a non-zero scalar k is denoted by:	R_{ij}	$R_i/0$	kR_i	$R_i + R_j$	○○●○
127. Adding k times the jth row to the ith row is denoted by:	R_ik_j	R_{ij}	kR_{ij}	$R_i + kR_j$	○○○●
128. Elementary operations can also be performed on the:	diagonals of a matrix	ranks only	columns of a matrix	minors only	○○●○
129. In the row echelon form, the first non-zero element in each non-zero row (leading entry) is:	−1	any number	0	1	○○○●
130. In the row echelon form, each leading entry lies in a column:	directly below the previous leading entry	in the first column only	to the right of the leading entry of the previous row	to the left of the leading entry of the previous row	○○●○
131. In the row echelon form, rows having all zero entries are placed:	in the first column	between non-zero rows	above all non-zero rows	below the rows having at least one non-zero element	○○○●
132. In the reduced row echelon form, the leading entry in each row is:	equal to the last entry of the row	any non-zero number	the only non-zero entry in its column	always zero	○○●○
133. The rank of a matrix is the number of:	zero rows in its echelon form	non-zero rows in its echelon form	columns in the matrix	elements in the matrix	○●○○

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Questions	A	B	C	D	A B C D
134. The rank of the 3 × 3 identity matrix is:	3	9	0	1	●○○○
135. The rank of the zero matrix is:	undefined	the order of the matrix	1	0	○○○●
136. The rank of the matrix [1 2; 2 4] is:	1	2	4	0	●○○○
137. The rank of the matrix [1 2; 3 4] is:	2	0	4	1	●○○○
138. The rank of the matrix [1 2 3; 2 4 6; 3 6 9] is:	1	0	3	2	●○○○
139. The rank of a non-singular 3 × 3 matrix is:	2	1	3	0	○○●○
140. The echelon form of [2 4; 1 3] obtained by row operations is:	[2 4; 0 1]	[1 2; 0 1]	[1 2; 1 3]	[1 0; 0 1]	○●○○
141. The matrix [0 1; 1 0] is not in echelon form because:	the leading entry of the second row is not to the right of the first	its leading entries are not 1	it has a zero row	it is a square matrix	●○○○
142. The matrix [1 2; 0 1] is in:	reduced echelon form	none of these	neither echelon form	row echelon form but not reduced echelon form	○○○●
143. To find the inverse of A using row operations, we write A and I side by side and reduce:	A to I; the I then becomes A^{-1}	I to A; the A then becomes zero	both to zero	A to zero	●○○○
144. The inverse of [1 2; 3 5] using row operations is:	[−1 2; 3 −5]	[−5 2; 3 −1]	[1 −2; −3 5]	[5 −2; −3 1]	○●○○
145. An equation $a_1x_1 + a_2x_2 = k$ with at least one of a_1, a_2 non-zero is called a:	trigonometric equation	cubic equation	linear equation in two variables	quadratic equation	○○●○
146. A collection of more than one linear equation considered together is called a:	polynomial	determinant	system of linear equations	matrix	○○●○
147. A system of linear equations is homogeneous if:	all coefficients are equal	it has no solution	at least one constant is non-zero	all constant terms are zero	○○○●
148. A system of linear equations is non-homogeneous if:	at least one constant term is non-zero	it has no variables	all constants are zero	it has only one equation	●○○○
149. A solution of a system of linear equations is a set of values of the variables that:	satisfies only the first equation	satisfies every equation of the system	makes all coefficients zero	makes the determinant zero	○●○○
150. A system of linear equations may have:	only a unique solution	only no solution	no solution, a unique solution or infinitely many solutions	only two solutions	○○●○

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Questions	A	B	C	D	A B C D
151. The solution x = y = z = 0 of a homogeneous system is called the:	augmented solution	trivial solution	unique non-zero solution	non-trivial solution	○●○○
152. The trivial solution always exists for a:	system with no equations	homogeneous system	non-homogeneous system only	inconsistent system	○●○○
153. Solutions other than the trivial solution are called:	non-trivial solutions	inconsistent solutions	zero solutions	augmented solutions	●○○○
154. A homogeneous system of linear equations may have a non-trivial solution if:	A is non-singular	$\|A\| \neq 0$	A = I	$\|A\| = 0$	○○○●
155. If the coefficient matrix A of a homogeneous system is non-singular, the system has:	exactly two solutions	infinitely many solutions	no solution	only the trivial solution	○○○●
156. A homogeneous system of linear equations is always:	unsolvable	non-linear	consistent	inconsistent	○○●○
157. A system having at least one solution is called:	homogeneous	inconsistent	consistent	augmented	○○●○
158. A system having no solution at all is called:	trivial	homogeneous	consistent	inconsistent	○○○●
159. A system of linear equations is consistent if:	Rank A > Rank A_b	$\|A\| = 0$	Rank A < Rank A_b	Rank A = Rank A_b	○○○●
160. If Rank A = Rank A_b = number of unknowns, the system has:	only the trivial solution	a unique solution	no solution	infinitely many solutions	○●○○
161. If Rank A = Rank A_b < number of unknowns, the system has:	exactly two solutions	infinitely many solutions	a unique solution	no solution	○●○○
162. If Rank A < Rank A_b, the system is:	inconsistent	consistent with a unique solution	consistent with infinitely many solutions	homogeneous	●○○○
163. The matrix formed by the coefficients of the unknowns together with the constants on the right side is called the:	identity matrix	adjoint matrix	cofactor matrix	augmented matrix	○○○●
164. The methods for solving a 3 × 3 non-homogeneous system include Gauss elimination, Gauss-Jordan and:	synthetic division	Cramer's rule only	matrix inversion	polar method	○○●○
165. In the Gauss elimination method, the augmented matrix is reduced to:	a zero matrix	an identity matrix only	echelon form	reduced echelon form only	○○●○
166. In the Gauss-Jordan method, the augmented matrix is reduced to:	the transpose	a zero matrix	reduced echelon form	a diagonal matrix with zeros	○○●○
167. In the matrix inversion method, the system AX = B has the solution:	$X = A^{-1}B$	$X = BA^{-1}$	$X = A^{t}B$	X = B/A	●○○○

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Questions	A	B	C	D	A B C D
168. The matrix inversion method can be used only when A is:	non-singular	a zero matrix	singular	rectangular	●○○○
169. The solution of the system x + y = 3 and x − y = 1 is:	x = 3, y = 0	x = 1, y = 2	x = 2, y = 1	x = 0, y = 3	○○●○
170. The solution of the system 2x + y = 5 and x + y = 3 is:	x = 5, y = −5	x = 2, y = 1	x = 3, y = −1	x = 1, y = 2	○●○○
171. The solution of 2x + y = 4 and x + 3y = 7 is:	x = 2, y = 1	x = 3, y = −2	x = 4, y = −4	x = 1, y = 2	○○○●
172. The solution of x + 2y = 3 and 2x + 4y = 7 is:	no solution (inconsistent)	a unique solution	x = 1, y = 1	infinitely many solutions	●○○○
173. The system x + y = 2 and 2x + 2y = 4 has:	infinitely many solutions	no solution	exactly two solutions	a unique solution	●○○○
174. For A = [1 2; 3 4] and B = [5; 11], the solution of AX = B is:	x = −1, y = 3	x = 1, y = 2	x = 2, y = 1	x = 5, y = 11	○●○○
175. The solution of x + y + z = 6, x − y + z = 2 and x + y − z = 0 is:	x = 3, y = 2, z = 1	x = 1, y = 2, z = 3	x = 1, y = 1, z = 4	x = 2, y = 2, z = 2	○●○○
176. The system x − 2y = 0 and 3x − 6y = 0 has:	only the trivial solution	non-trivial solutions as well as the trivial solution	no solution	exactly one non-zero solution	○●○○
177. Matrices are used in encryption to scramble data for security and to:	store the data on paper	delete the data	measure the length of the data	encode and decode the data using a key	○○○●
178. The key that helps encode and decode data in cryptography is generated by:	logarithms only	matrices	prime numbers only	a single scalar	○●○○
179. The decoding of a message encrypted using a matrix key uses the:	identity matrix only	rank of the matrix	transpose of the zero matrix	inverse of the matrix	○○○●
180. Matrices are used in the transformation of:	geometric shapes	only numbers	only equations	only sets	●○○○
181. Matrices are used in the analysis of a:	only the stock of a shop	only the weather	social network	only a family tree	○○●○
182. Matrices are applied to real-world problems such as graphic design, cryptography and:	cooking	sports scoring only	painting walls	seismic analysis	○○○●
183. Gauss elimination is a method to solve a system of linear equations that uses:	only determinants	elementary row operations	only scalar multiples	only transposes	○●○○
184. If AB = 0 for two matrices A and B, then:	it is not necessary that A = 0 or B = 0	B must be zero	both A and B must be zero	A must be zero	●○○○

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Questions	A	B	C	D	A B C D
185. If A is of order m × n and B is of order n × p, then AB is of order:	p × m	m × n	n × n	m × p	○○○●
186. Matrix multiplication is associative, that is:	$A(BC) = (AB)C^t$	(AB)C = A(BC)	(AB)C = (BA)C	AB = BA	○●○○
187. Matrix multiplication is distributive over addition, that is:	A(B + C) = BA + CA	A(B + C) = AB + C	A(B + C) = AB + AC	A(B + C) = ABC	○○●○
188. For any square matrix A and the identity matrix I of the same order, AI = IA equals:	A^t	I	A	0	○○●○
189. The number of cofactors in a 3 × 3 matrix is:	3	27	6	9	○○○●
190. The number of minors in a 2 × 2 matrix is:	1	2	4	8	○○●○
191. Which of the following is NOT an elementary row operation?	Adding a multiple of one row to another	Multiplying a row by a non-zero scalar	Interchanging two rows	Squaring every element of a row	○○○●
192. The rank of a 2 × 3 matrix cannot exceed:	3	2	6	5	○●○○
193. A homogeneous system of three equations in three unknowns with Rank A = 3 has:	no solution	infinitely many solutions	only the trivial solution	exactly two solutions	○○●○
194. The augmented matrix of a system compared with its coefficient matrix has:	one more row	one less column	the same order	one more column	○○○●
195. If Rank A = Rank A_b = 2 for a system of three unknowns, the system has:	infinitely many solutions	exactly three solutions	a unique solution	no solution	●○○○
196. The adjoint of the identity matrix of order 2 is:	the zero matrix	[−1 0; 0 −1]	[0 1; 1 0]	the identity matrix	○○○●
197. A 2 × 2 matrix whose determinant is zero is called:	non-singular	singular	identity	skew-symmetric	○●○○
198. A matrix in which $a_{ij} = 0$ for i ≠ j and $a_{ii} = k \neq 0$ is called a:	row matrix	rectangular matrix	scalar matrix	zero matrix	○○●○
199. The matrix having all elements below and above the main diagonal zero and diagonal elements different is a:	identity matrix	diagonal matrix	zero matrix	scalar matrix	○●○○
200. In the Gauss elimination method, after reaching the echelon form, the unknowns are found by:	squaring the entries	back substitution	taking the inverse of the determinant	taking the transpose	○●○○

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