MTH501 Midterm Solved Paper 2008 - Linear Algebra

MTH501 - Midterm Solved Paper of Linear Algebra - Year 2008

MIDTERM EXAMINATION

Fall 2008 (Session - 2)

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Time: 60 min

M = Marks= 38

MTH501 - Linear Algebra - Q. No. 1 (M - 1)

If A is a 2 x 2 matrix, the area of the parallelogram determined by the columns of A is

► A^{-1}

► det A

► adj A

MTH501 - Linear Algebra - Q. No. 2 (M - 1)

Cramer's rule leads easily to a general formula for

► the inverse of an *n* x *n* matrix A

► the adjugate of an *n* x *n* matrix A

► the determinant of an *n* x *n* matrix A

MTH501 - Linear Algebra - Q. No. 3 (M - 1)

The transpose of an upper triangular matrix is

► lower triangular matrix

► upper triangular matrix

► diagonal matrix

MTH501 - Linear Algebra - Q. No. 4 (M - 1)

Let A be a square matrix of order *3* x *3* with det(A) =21 , then det(2A)=

► **168**

► 186

► 21

► 126

MTH501 - Linear Algebra - Q. No. 5 (M - 1)

A basis is a linearly independent set that is as large as possible. (http://www.vuzs.info/old-papers.html)

► **True**

► False

MTH501 - Linear Algebra - Q. No. 6 (M - 1)

Col A is all of 0^m if and only if

► the equation A*x* = 0 has a solution for each b in 0^m

► **the equation A*x*=b has a solution for each b in 0^m**

► the equation A*x*=b has a solution for a fixed b in 0^m.

MTH501 - Linear Algebra - Q. No. 7 (M - 1)

A = | A_{11} A_{12} | B = | B_1|

| A_{21} A_{22} | | B_2|

If and, then the partitions of A and B

► are not conformable for block multiplication

► **are conformable for AB block multiplication**

► are not conformable for BA block multiplication

MTH501 - Linear Algebra - Q. No. 8 (M - 1)

Two vectors are linearly dependent if and only if they lie

► on a line parallel to x-axis

► on a line through origin

► on a line parallel to y-axis

MTH501 - Linear Algebra - Q. No. 9 (M - 1)

The equation x = p + t v describes a line

► through v parallel to p

► through p parallel to v

► through origin parallel to p

MTH501 - Linear Algebra - Q. No. 10 (M - 1)

Let A be an *m* x *n* matrix. If for each b in 0^m the equation Ax=b has a solution then

► A has pivot position in only one row

► Columns of A span 0^m

► Rows of A span 0^m

MTH501 - Linear Algebra - Q. No. 11 (M - 1)

$\boldsymbol{x_1 - 2x_2 + x_3 = 8}$

$\boldsymbol{2x_2 + 7x_3 = 0}$

$\boldsymbol{-4x_1 + 3x_1 + 9x_3 = -6}$

Given the system the augmented matrix for the system is vuzs

| 1 -2 1 |

| 0 2 -7|

|-4 3 9 |

►| 1 -2 1 0|

| 0 2 -7 8|

|-4 3 9 -6|

►| 1 -2 1 |

| 0   2   -8 |

|-4   5   9 |

►**| 1 -2   1   8|**

| 0   2   -7   0|

|-4   3   9   -6| (http://www.vuzs.info/old-papers.html)

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MTH501 - Linear Algebra - Q. No. 12   (M - 1)

| 1   2   0 |

| 0   1   0 |

| 1   0   0 |

Consider the linear transformation *T* such that

| 1   2   0 |

| 0   1   0 |

| 1   0   0 |

is the matrix of linear transformation then *T*

|2|

|4|

|6|

is

|10|

| 4 |

| 2 |

► |1|

|0|

|9|

►|10|

| 4 |

| 1 |

►|1|

|2|

|3|

|2|

MTH501 - Linear Algebra - Q. No. 13 (M - 1)

| a b c | | a b c |

| d e f | = 5 | 3d 3e 3f |

If | g h i | then | g h i | will be

► 15

<u>► 45</u>

► 135

► 60

MTH501 - Linear Algebra - Q. No. 14 (M - 1)

For an n×n matrix $(A^t)^t$ =

► A^t

<u>► A</u>

► A^{-1}

► $(A^{-1})^{-1}$

MTH501 - Linear Algebra - Q. No. 15 (M - 1)

Each Linear Transformation T from R^n to R^m is equivalent to multiplication by a matrix A of order

► m´n

<u>► n´m</u>

► n´n

► m´m

MTH501 - Linear Algebra - Q. No. 16 (M - 1)

Reduced echelon form of the matrix | 1 2 3 | is

| 2 3 4 |

► | 1 2 3 |

| 0 0 1 |

► | 1 0 3 |

| 0 0 1 |

► **| 1 0 -1|**

| 0 1 -2|

► | 1 0 0 |

| 0 1 1 |

MTH501 - Linear Algebra - Q. No. 17 (M - 2)

Find vector and parametric equations of the plane that passes through the origin of $\boldsymbol{R}^3$ and is parallel to the vectors $\boldsymbol{v}_1$ = (1, 2, 5) and $\boldsymbol{v}_2$ = (5, 0, 4).

MTH501 - Linear Algebra - Q. No. 18 (M - 2)

Which of the following is true? If V is a vector space over the field F.(justify your answer)

(a) {*x* + *y* / *x* ε*V* , *y* ε *V*} = *V*

(b) {*x* + *y* / *x* ε*V* , *y* ε *V*} = *V* x *V*

(c) {λ*v* / *v* ε *V* , λ ε *F*} = *F* x *V*

MTH501 - Linear Algebra - Q. No. 19 (M - 3)

Let

| 1 | |-2 | | h |

v_1 = | 0 | , v_2= | 1 | , and *y* =| -3|

|-2| | 7 | |-5|

For what value(s) of h is ***y*** in the plane generated by $\boldsymbol{v_1}$ and $\boldsymbol{v_2}$?

MTH501 - Linear Algebra - Q. No. 20 (M - 5)

With T defined by T(x)= Ax , find a vector x whose image under T is b, and determine whether x is unique. vuzs

| 1 - 5 -7 | , b = | -2 |

| -3 7 5 | |-2 |

MTH501 - Linear Algebra - Q. No. 21 (M - 10)

Given A and b , write the augmented matrix for the linear system that corresponds to the matrix equation Ax = b .Then solve the system and write the solution as a vector. (http://www.vuzs.info/old-papers.html)

A = | 1 2 1 | B = | 0 |

| -3 -1 2 | | 1 |

| 0 5 3 | |-1 |

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