MTH501 Midterm Paper 2010 Solved - Linear Algebra

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Linear Algebra Objective and Subjective Question Paper

Midterm Examination - (Session - 3)

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Time: 60 min
M = Marks

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

If A is a 2x 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) vuzs

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 lower triangular matrix is

- ► lower triangular matrix
- ► **upper triangular matrix**
- ► diagonal matrix

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

The transpose of an upper triangular matrix is

► **lower triangular matrix**

► upper triangular matrix

► diagonal matrix

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

Let A be a square matrix of order 3x3 with det(A) = 21, then det(2A)=

► **168**

► 186

► 21

► 126

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

A basis is a linearly independent set that is as large as possible. (http://www.vuzs.info/study-portals/bscs-study-portal.html)

► **True**

► False

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

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

► **A has pivot position in only one row (may be this option is true)**

► Columns of A span λ^m

► Rows of A span λ^m

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

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

| 2 3 4 |

| 1 2 3 |

| 0 0 1 |

| 1 0 -1 |

| 0 0 1 |

| 1 0 -1 |

| 0 1 2 |

| 1 0 0 |

| 0 1 1 |

MTH501 - Linear Algebra - Q. No. 22 (M - 3)

find that is invertible or not $T(X_1,X_2)=T(6X_1+8X_2, 5X_1-8X_2)$

MTH501 - Linear Algebra - Q. No. 23 (M - 3)

Find the volume of parallelogram of the vertices (1,2,4) (2,4,-7) and (-1,-3,20)

MTH501 - Linear Algebra - Q. No. 24 (M - 2)

Which of the following is true? If V is a vector space over the field F. (http://www.vuzs.info/study-portals/bscs-study-portal.html) (justify your answer)

(a) $\{x+y / x \in V, y \in V\} = V$

(b) $\{x+y / x \in V, y \in V\} = V \times V$

(c) $\{\lambda v / v \in V, \lambda \in F\} = F \times V$

MTH501 - Linear Algebra - Q. No. 25 (M - 5)

Let

| 1 | , | 3 | , | -3 |

| 0 | , | 2 | , | -5 |

|-2 | , | -4| , | 1 |

is this in R^3 or not?

MTH501 - Linear Algebra - Q. No. 26 (M - 5)

Justify that

$A^2=I$

if

$$A = \begin{vmatrix} 1 & 0 \\ 3 & -1 \end{vmatrix}$$

, if and only $M^2 = I$. justify your answer by portioned matrix of M

$$M = \begin{vmatrix} 1 & 0 & 0 & 0 \\ 3 & -1 & 0 & 0 \\ 1 & 0 & -1 & 0 \\ 0 & 1 & -3 & 1 \end{vmatrix}$$