

Department of Mathematics and Statistics (SQU)
MATH 3171 - Linear Algebra and Multivariate Calculus for Engineers
Spring 2008 - Quiz 1A

Name:

Student ID:

1. Let $u = [a \ b \ c]$, $v = [1 \ 2 \ 3]$ and $A = \begin{bmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$. Compute: $A^T u^T$ and $u^T v v^T$.
2. Solve the following linear system by Gauss elimination:
$$\begin{cases} x_1 - x_2 + 2x_3 - x_4 = 0 \\ -3x_1 + 3x_2 - 6x_3 + 5x_4 = 12 \\ 2x_1 - 2x_2 + 4x_3 - 2x_4 = 0 \end{cases}.$$
3. Determine whether the vectors $\begin{bmatrix} 1 \\ 2 \\ 4 \end{bmatrix}$, $\begin{bmatrix} -2 \\ 0 \\ -4 \end{bmatrix}$, $\begin{bmatrix} -1 \\ 0 \\ -2 \end{bmatrix}$ are linearly dependent or independent.

Department of Mathematics and Statistics (SQU)
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Name:

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1. Let $u = [a \ b]$, $v = [1 \ 2 \ 3]$ and $A = \begin{bmatrix} 0 & -1 \\ 0 & 1 \\ 1 & 0 \end{bmatrix}$. Compute: $A^T v^T$ and $u^T v v^T$.
2. Solve the following linear system by Gauss elimination:
$$\begin{cases} x_1 - x_2 + 2x_3 - x_4 = 0 \\ 2x_1 - 2x_2 + 4x_3 - 2x_4 = 0 \\ -3x_1 + 3x_2 - 6x_3 + 6x_4 = 12 \end{cases}.$$
3. Determine whether the vectors $\begin{bmatrix} 1 \\ 2 \\ 4 \end{bmatrix}$, $\begin{bmatrix} -2 \\ 0 \\ -4 \end{bmatrix}$, $\begin{bmatrix} -1 \\ 0 \\ -2 \end{bmatrix}$ are linearly dependent or independent.

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1. Let $u = [a \ b \ c]$, $v = [1 \ 2 \ 3]$ and $A = \begin{bmatrix} 0 & 0 & -1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$. Compute: $A^T v^T$ and $v^T u u^T$.
2. Solve the following linear system by Gauss elimination:
$$\begin{cases} x_1 - x_2 + 2x_3 - 3x_4 = 0 \\ -3x_1 + 3x_2 - 6x_3 + 5x_4 = 8 \\ 2x_1 - 2x_2 + 4x_3 - 6x_4 = 0 \end{cases}.$$
3. Determine whether the vectors $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$, $\begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix}$, $\begin{bmatrix} -1 \\ 1 \\ 3 \end{bmatrix}$ are linearly dependent or independent.

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1. Let $u = [a \ b]$, $v = [1 \ 2 \ 3]$ and $A = \begin{bmatrix} 0 & -1 \\ 0 & 1 \\ 1 & 0 \end{bmatrix}$. Compute: $u A^T$ and $u A^T v^T$.
2. Solve the following linear system by Gauss elimination:
$$\begin{cases} -x_1 + x_2 - 2x_3 + 3x_4 = 0 \\ -3x_1 + 3x_2 - 6x_3 + 2x_4 = 21 \\ 2x_1 - 2x_2 + 4x_3 - 6x_4 = 0 \end{cases}.$$
3. Determine whether the vectors $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$, $\begin{bmatrix} 0 \\ 1 \\ 2 \end{bmatrix}$, $\begin{bmatrix} -1 \\ 1 \\ 3 \end{bmatrix}$ are linearly dependent or independent.