

April 3, 2013

1.) Determine which of the following sets of vectors are linearly dependent versus linearly independent. Circle the correct answer

[10] 1i.) $\left\{ \begin{pmatrix} 1 \\ 2 \end{pmatrix}, \begin{pmatrix} -1 \\ 3 \end{pmatrix}, \begin{pmatrix} 4 \\ 5 \end{pmatrix} \right\}$

a.) linearly dependent

b.) linearly independent

[10] 1ii.) $\left\{ \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}, \begin{pmatrix} -1 \\ -2 \\ -3 \end{pmatrix} \right\}$

a.) linearly dependent

b.) linearly independent

[10] 1iii.) $\left\{ \begin{pmatrix} 1 \\ 2 \\ 4 \end{pmatrix}, \begin{pmatrix} -1 \\ 3 \\ 4 \end{pmatrix} \right\}$

a.) linearly dependent

b.) linearly independent

[10] 1iv.) $\left\{ \begin{pmatrix} 1 \\ 2 \\ 4 \end{pmatrix}, \begin{pmatrix} 1 \\ 3 \\ 2 \end{pmatrix}, \begin{pmatrix} 2 \\ 5 \\ 6 \end{pmatrix} \right\}$

a.) linearly dependent

b.) linearly independent

[10] 1v.) $\left\{ \begin{pmatrix} 1 \\ 2 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 \\ 3 \\ 0 \end{pmatrix}, \begin{pmatrix} 2 \\ 3 \\ 6 \end{pmatrix} \right\}$

a.) linearly dependent

b.) linearly independent

2.) If $A \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \begin{pmatrix} 5 \\ 5 \end{pmatrix}$, $A \begin{pmatrix} 2 \\ 1 \end{pmatrix} = \begin{pmatrix} 4 \\ 4 \end{pmatrix}$, $A \begin{pmatrix} 2 \\ 2 \end{pmatrix} = \begin{pmatrix} 6 \\ 6 \end{pmatrix}$, $A \begin{pmatrix} 2 \\ 3 \end{pmatrix} = \begin{pmatrix} 8 \\ 8 \end{pmatrix}$, $A \begin{pmatrix} 3 \\ 2 \end{pmatrix} = \begin{pmatrix} 7 \\ 7 \end{pmatrix}$.

[10] 2a.) An eigenvalue of A is _____

[15] 2b.) 4 eigenvectors corresponding to this eigenvalue are _____

[15] 3a.) Find the eigenvalues of $A = \begin{pmatrix} 1 & 1 \\ 2 & -1 \end{pmatrix}$

[10] 3b.) Find one eigenvector corresponding to each eigenvalue.

An eigenvalue of A is _____ and
an eigenvector corresponding to this eigenvalue is _____

An eigenvalue of A is _____ and
an eigenvector corresponding to this eigenvalue is _____

