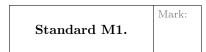
| Name: |            |
|-------|------------|
| J#:   | Dr. Clontz |
| Date: |            |

Math 237 – Linear Algebra Fall 2017

### Version 1

Show all work. Answers without work will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.



Let

$$A = \begin{bmatrix} 3 \\ 5 \\ -1 \end{bmatrix} \qquad B = \begin{bmatrix} 2 & -1 \\ 0 & 4 \\ 3 & 1 \end{bmatrix} \qquad C = \begin{bmatrix} 1 & -1 & 3 & -3 \\ 2 & 1 & -1 & 2 \end{bmatrix}$$

Standard M2. 
$$\begin{bmatrix} 1 & 3 & 3 & 7 \\ 1 & 3 & -1 & -1 \\ 2 & 6 & 3 & 8 \\ 1 & 3 & -2 & -3 \end{bmatrix}$$
 is invertible.

Standard M3.

Find the inverse of the matrix  $\begin{bmatrix} 1 & -4 & 5 \\ -5 & 24 & -28 \\ 1 & -5 & 6 \end{bmatrix}.$ 

Standard G2.

Mark:

Compute the eigenvalues, along with their algebraic multiplicities, of the matrix  $\begin{bmatrix} 9 & -3 & 2 \\ 19 & -6 & 5 \\ -11 & 4 & -2 \end{bmatrix}$ .

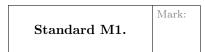
Find the eigenspace associated to the eigenvalue 1 in the matrix  $A = \begin{bmatrix} 9 & -3 & 2 \\ 19 & -6 & 5 \\ -11 & 4 & -2 \end{bmatrix}$ 

| Name: |            |
|-------|------------|
| J#:   | Dr. Clontz |
| Date: |            |

Math 237 – Linear Algebra Fall 2017

## Version 2

Show all work. Answers without work will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.



Let

$$A = \begin{bmatrix} 3 \\ 5 \\ -1 \end{bmatrix} \qquad B = \begin{bmatrix} 2 & -1 \\ 0 & 4 \\ 3 & 1 \end{bmatrix} \qquad C = \begin{bmatrix} 1 & -1 & 3 & -3 \\ 2 & 1 & -1 & 2 \end{bmatrix}$$

Standard M3.

Find the inverse of the matrix  $\begin{bmatrix} 3 & 1 & 3 \\ 2 & -1 & -6 \\ 1 & 1 & 4 \end{bmatrix}$ .

Standard G2.

Mark:

Compute the eigenvalues, along with their algebraic multiplicities, of the matrix  $\begin{bmatrix} 8 & -3 & 2 \\ 15 & -5 & 5 \\ -3 & 2 & 1 \end{bmatrix}$ .

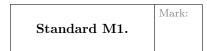
Find the eigenspace associated to the eigenvalue 3 in the matrix  $A = \begin{bmatrix} 1 & -2 & -1 & 0 \\ -4 & -1 & -2 & 0 \\ 14 & 12 & 11 & 2 \\ -14 & -10 & -9 & -1 \end{bmatrix}$ .

| Name: |            |
|-------|------------|
| J#:   | Dr. Clontz |
| Date: |            |

Math 237 – Linear Algebra Fall 2017

# Version 3

Show all work. Answers without work will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.



Let

$$A = \begin{bmatrix} 3 \\ 5 \\ -1 \end{bmatrix} \qquad B = \begin{bmatrix} 2 & -1 \\ 0 & 4 \\ 3 & 1 \end{bmatrix} \qquad C = \begin{bmatrix} 1 & -1 & 3 & -3 \\ 2 & 1 & -1 & 2 \end{bmatrix}$$

| Standard M2.            | Mark:  |  |  |                |
|-------------------------|--|--|--|----------------|
| Determine if the matrix | $\begin{bmatrix} 1 \\ 2 \\ -1 \end{bmatrix}$ | $ \begin{array}{c} \overline{3} \\ 7 \\ -1 \end{array} $ | $\begin{bmatrix} -1 \\ 0 \\ 5 \end{bmatrix}$ | is invertible. |

Mark: Standard M3.

Find the inverse of the matrix  $\begin{bmatrix} 2 & -1 & -3 \\ -14 & 9 & 24 \\ 3 & -2 & -5 \end{bmatrix}.$ 

Standard G2.

Mark:

Let  $A = \begin{bmatrix} -3 & 1 & 0 \\ -8 & 2 & -1 \\ 0 & 2 & 3 \end{bmatrix}$ . List the eigenvalues of A along with their algebraic multiplicities.

Find the eigenspace associated to the eigenvalue -1 in the matrix  $A = \begin{bmatrix} 9 & -3 & 2 \\ 19 & -6 & 5 \\ -11 & 4 & -2 \end{bmatrix}$ 

| Name: |            |
|-------|------------|
| J#:   | Dr. Clontz |
| Date: |            |

Math 237 – Linear Algebra Fall 2017

## Version 4

Show all work. Answers without work will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.



Let

$$A = \begin{bmatrix} 0 & 0 & -1 & -1 \\ 1 & 3 & 7 & 2 \end{bmatrix} \qquad B = \begin{bmatrix} 0 & 1 & 7 & 7 \\ -1 & -2 & 0 & 4 \\ 0 & 0 & 1 & 5 \end{bmatrix} \qquad C = \begin{bmatrix} 3 & 2 \\ 0 & 1 \\ -2 & -1 \end{bmatrix}$$

| Standard M2.            | Mark  | :           |  |                |
|-------------------------|---|-------------|--|----------------|
| Determine if the matrix | $\begin{bmatrix} -3 \\ -8 \\ 0 \end{bmatrix}$ | 1<br>2<br>2 | $\begin{bmatrix} 0 \\ -1 \\ 3 \end{bmatrix}$ | is invertible. |

Standard M3.

Mark:

Compute the inverse of the matrix 
$$\begin{bmatrix} 1 & 2 & 3 & 0 \\ 0 & -1 & 4 & -2 \\ 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 1 \end{bmatrix}.$$

Standard G2.

Mark:

Compute the eigenvalues, along with their algebraic multiplicities, of the matrix  $\begin{bmatrix} 2 & -3 & 2 \\ 8 & -9 & 5 \\ 8 & -7 & 3 \end{bmatrix}$ .

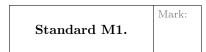
Find the eigenspace associated to the eigenvalue 1 in the matrix  $A = \begin{bmatrix} 8 & -3 & -1 \\ 21 & -8 & -3 \\ -7 & 3 & 2 \end{bmatrix}$ 

| Name: |            |
|-------|------------|
| J#:   | Dr. Clontz |
| Date: |            |

Math 237 – Linear Algebra Fall 2017

## Version 5

Show all work. Answers without work will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.



Let

$$A = \begin{bmatrix} 2 & 3 \\ 0 & 1 \end{bmatrix} \qquad B = \begin{bmatrix} 3 & 1 & 0 \end{bmatrix} \qquad C = \begin{bmatrix} 0 & -1 & 4 \\ 1 & -1 & 2 \end{bmatrix}$$

|                         | Ma   | rk:       |                  |   |               |
|-------------------------|--|-----------|------------------|---|---------------|
| Standard M2.            |  |           |                  |   |               |
| Determine if the matrix | $\begin{bmatrix} 3 \\ 2 \\ 0 \\ 1 \end{bmatrix}$ | -1 1 1 -2 | 0<br>1<br>1<br>0 | $\begin{bmatrix} 4 \\ 1 \\ -1 \\ 3 \end{bmatrix}$ | is invertible |

Standard G2.

Mark:

Compute the eigenvalues, along with their algebraic multiplicities, of the matrix  $\begin{bmatrix} 8 & -3 & 2 \\ 23 & -9 & 5 \\ -7 & 2 & -3 \end{bmatrix}$ .

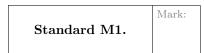
Compute the eigenspace of the eigenvalue -1 in the matrix  $\begin{bmatrix} 4 & -2 & -1 \\ 15 & -7 & -3 \\ -5 & 2 & 0 \end{bmatrix}$ .

| Name: |            |
|-------|------------|
| J#:   | Dr. Clontz |
| Date: |            |

Math 237 – Linear Algebra Fall 2017

#### Version 6

Show all work. Answers without work will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.



Let

$$A = \begin{bmatrix} 1 & 3 & -1 \\ 0 & 0 & 7 \end{bmatrix} \qquad B = \begin{bmatrix} 0 & 1 & 7 & 7 \\ -1 & -2 & 0 & 4 \\ 0 & 0 & 1 & 5 \end{bmatrix} \qquad C = \begin{bmatrix} 3 \\ 1 \end{bmatrix}$$

Standard M2. 
$$\begin{bmatrix} 2 & 1 & 0 & 3 \\ 1 & -1 & 0 & 1 \\ 3 & 2 & -1 & 7 \\ 4 & 1 & 2 & 0 \end{bmatrix}$$
 is invertible.

Find the inverse of the matrix  $\begin{bmatrix} 6 & 0 & 1 \\ -14 & 3 & -4 \\ -23 & 4 & -6 \end{bmatrix}$ .

Standard G2.

Mark:

Compute the eigenvalues, along with their algebraic multiplicities, of the matrix  $\begin{bmatrix} 9 & -3 & 2 \\ 19 & -6 & 5 \\ -11 & 4 & -2 \end{bmatrix}$ .

Find the eigenspace associated to the eigenvalue 2 in the matrix  $A = \begin{bmatrix} 8 & -3 & 2 \\ 15 & -5 & 5 \\ -3 & 2 & 1 \end{bmatrix}$