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

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

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

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  $\begin{bmatrix} 8 & -3 & 2 \\ 23 & -9 & 5 \\ -7 & 2 & -3 \end{bmatrix}$ .

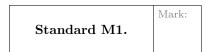
Compute the eigenspace of the eigenvalue -1 in the matrix  $\begin{bmatrix} 4 & -2 & -1 \\ 15 & -7 & -3 \\ -5 & 2 & 0 \end{bmatrix}$ .

Name:	
J#:	Dr. Clontz
Date:	

Math 237 – Linear Algebra Fall 2017

# Version 2

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Let

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

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

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  $\begin{bmatrix} 9 & -3 & 2 \\ 19 & -6 & 5 \\ -11 & 4 & -2 \end{bmatrix}$ .

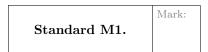
Compute the eigenspace associated to the eigenvalue 2 in the matrix  $\begin{bmatrix} -1 & 1 & 0 \\ -9 & 5 & 0 \\ 15 & -5 & 2 \end{bmatrix}.$ 

Name:	
J#:	Dr. Clontz
Date:	

Math 237 – Linear Algebra Fall 2017

## Version 3

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Let

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

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

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  $\begin{bmatrix} 9 & -3 & 2 \\ 19 & -6 & 5 \\ -11 & 4 & -2 \end{bmatrix}$ .

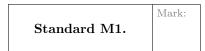
Compute the eigenspace of the eigenvalue -1 in the matrix  $\begin{bmatrix} 4 & -2 & -1 \\ 15 & -7 & -3 \\ -5 & 2 & 0 \end{bmatrix}$ .

Name:	
J#:	Dr. Clontz
Date:	

Math 237 – Linear Algebra Fall 2017

#### Version 4

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Let

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

Standard M2.	Mar	k:		
Determine if the matrix	$\begin{bmatrix} 3 \\ 2 \\ 0 \end{bmatrix}$	-1 1 1	$\begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$	is invertible.

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:

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.

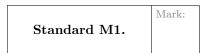
Compute the eigenspace associated to the eigenvalue 2 in the matrix  $\begin{bmatrix} -1 & 1 & 0 \\ -9 & 5 & 0 \\ 15 & -5 & 2 \end{bmatrix}.$ 

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

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

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

Find the inverse of the matrix  $\begin{bmatrix} 8 & 5 & 3 & 0 \\ 3 & 2 & 1 & 1 \\ 5 & -3 & 1 & -2 \\ -1 & 2 & 0 & 1 \end{bmatrix}.$ 

Standard G2.

Mark:

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

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

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Let

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

Standard M2.	Mar	k:		
Determine if the matrix	$\begin{bmatrix} 3 \\ 2 \\ 0 \end{bmatrix}$	-1 1 1	$\begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$	is invertible.

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  $\begin{bmatrix} 2 & -3 & 2 \\ 8 & -9 & 5 \\ 8 & -7 & 3 \end{bmatrix}$ .

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