

Name: \_\_\_\_\_

**MASTERY QUIZ DAY 29**

Math 237 – Linear Algebra

**Version 2**

Fall 2017

Show all work and justify all of your answers. Answers without work or sufficient reasoning will not receive credit. You may use a calculator, but you must show all relevant work to receive credit for a standard.

**G1.** Compute the determinant of the matrix  $\begin{bmatrix} 3 & -1 & 0 & 7 \\ 2 & 1 & 1 & -1 \\ 0 & 1 & 1 & 3 \\ 0 & 0 & 0 & 1 \end{bmatrix}$ .

**Solution:** 2

□

**G3.** Find the eigenspace associated to the eigenvalue 2 in the matrix  $A = \begin{bmatrix} 0 & 1 & 0 & 0 \\ -4 & 4 & 0 & 0 \\ 11 & -6 & 1 & -1 \\ -9 & 5 & 1 & 3 \end{bmatrix}$ .

**Solution:** The eigenspace is spanned by  $\begin{bmatrix} -1 \\ -2 \\ 1 \\ 0 \end{bmatrix}$  and  $\begin{bmatrix} -1 \\ -2 \\ 0 \\ 1 \end{bmatrix}$ .

□

**G4.** Compute the geometric multiplicity of the eigenvalue 1 in the matrix  $A = \begin{bmatrix} 8 & -3 & -1 \\ 21 & -8 & -3 \\ -7 & 3 & 2 \end{bmatrix}$

**Solution:** The eigenspace is spanned by  $\begin{bmatrix} 3 \\ \frac{7}{1} \\ 0 \end{bmatrix}$  and  $\begin{bmatrix} 1 \\ \frac{7}{0} \\ 1 \end{bmatrix}$ , so the geometric multiplicity is 2.

□

**G1:**

**G3:**

**G4:**