Solutions

Total: 15 points

MATH 201: Linear Algebra – Week 2 Quiz

NAME: _____ ID Number: _____

**Problem 1.** Circle the matrices which are in reduced row echelon form.

$$\begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix} \quad \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 2 \\ 0 & 0 & 1 & 0 \end{bmatrix} \quad \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad \begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$$

4 points

$$\begin{bmatrix} 1 & 2 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{bmatrix} \quad \begin{bmatrix} 1 & 2 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

**Problem 2.** Write the *augmented matrix* of the system

$$\begin{cases} x = y + z \\ y - 2x = 3z \\ 1 + x + y + z = 0 \end{cases}$$

$$\begin{aligned} x - y - z &= 0 \\ -2x + y - 3z &= 0 \\ x + y + z &= -1 \end{aligned} \qquad \left[\begin{array}{ccc|c} 1 & -1 & -1 & 0 \\ -2 & 1 & -3 & 0 \\ 1 & 1 & 1 & -1 \end{array}\right]$$

2 points

**Problem 3.** *Define* the following terms:

- The size of a matrix = $n \times m$ where $n$ is the number of rows and $m$ is the number of columns
- Vector → A matrix with a single column (or row)
- Pivot column → In the reduced row echelon form of a matrix, a column containing a leading 1.

Recall that in RREF, the first nonzero entry in each row must be 1. These are called leading (or pivot) 1's.

6 points