**MATH 3B**
**LINEAR ALGEBRA**

**Directions: Write/type your answers on a bond paper. Show complete solution in each problem. Upload your answers as picture/pdf file in the e-learning site.**

I. Use Gauss-Jordan elimination to transform the matrix in reduced row echelon form.

$$\begin{bmatrix} 1 & -3 & -6 & 5 & -2 \\ 2 & -2 & -1 & 3 & 1 \\ -2 & -3 & 0 & 3 & -1 \\ 1 & 4 & 5 & -9 & -7 \end{bmatrix}$$

II. Determine whether the given matrices are invertible or not.

1. $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 2 \\ 0 & 1 & 2 \end{bmatrix}$

2. $B = \begin{bmatrix} 2 & 1 & -2 \\ 3 & 4 & 6 \\ 7 & 6 & 2 \end{bmatrix}$

III. Write the following system of linear equations in matrix form and find the solution using the Gauss-Jordan method.

1. $\begin{aligned} x_1 + 2x_2 &= 8 \\ 3x_1 - 4x_2 &= 4 \end{aligned}$

2. $\begin{aligned} x_1 + x_2 - 2x_3 &= 5 \\ 2x_1 + 3x_2 + 4x_3 &= 2 \end{aligned}$

3. $\begin{aligned} x_1 + x_2 + 3x_3 &= 3 \\ -x_1 + x_2 + x_3 &= -1 \\ 2x_1 + 3x_2 + 8x_3 &= 4 \end{aligned}$