

Math 105 - Finite Mathematics - J-term 2017

Quiz 8

January 18, 2017

Name: _____

Problem 1. Solve the system of equations using Gauss-Jordan elimination

$$2x + 4y - 6z = 1$$

$$3x + 3y - 3z = 5$$

$$\left[\begin{array}{ccc|c} 2 & 4 & -6 & 1 \\ 3 & 3 & -3 & 5 \end{array} \right] \sim \left[\begin{array}{ccc|c} 1 & 2 & -3 & 1/2 \\ 3 & 3 & -3 & 5 \end{array} \right] \sim \left[\begin{array}{ccc|c} 1 & 2 & -3 & 1/2 \\ 0 & -3 & 6 & 7/2 \end{array} \right]$$

$$\sim \left[\begin{array}{ccc|c} 1 & 2 & -3 & 1/2 \\ 0 & 1 & -2 & -7/6 \end{array} \right] \sim \left[\begin{array}{ccc|c} 1 & 0 & 1 & 17/6 \\ 0 & 1 & -2 & -7/6 \end{array} \right]$$

$$\begin{array}{l} x = \frac{17}{6} - t \\ y = 2t - \frac{7}{6} \\ z = t \end{array}$$

Problem 2. Let

$$A = \begin{bmatrix} 2 & -1 & 3 \\ 0 & 4 & 2 \end{bmatrix}, B = \begin{bmatrix} -3 & 1 \\ 2 & 5 \end{bmatrix}, \text{ and } C = \begin{bmatrix} 3 & -2 \\ 0 & -1 \\ 1 & 2 \end{bmatrix}.$$

Compute the matrix $B + AC$.

$$AC = \begin{bmatrix} 2 & -1 & 3 \\ 0 & 4 & 2 \end{bmatrix} \begin{bmatrix} 3 & -2 \\ 0 & -1 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 9 & 3 \\ 2 & 0 \end{bmatrix}$$

$$B + AC = \begin{bmatrix} -3 & 1 \\ 2 & 5 \end{bmatrix} + \begin{bmatrix} 9 & 3 \\ 2 & 0 \end{bmatrix} = \begin{bmatrix} 6 & 4 \\ 4 & 5 \end{bmatrix}$$