

Math 1314  
Chapter 6 Review

1. Solve the system of equations by using Gauss-Jordan method:

$$x + 2y - 3z = -3$$

$$2x + 3y - z = 5$$

$$3x - y - 5z = 6$$

2. Solve the system of equations by using Gauss-Jordan method:

$$x + 2y + 3z = 5$$

$$3y - 15z = 0$$

3. If  $A = \begin{bmatrix} 3 & 1 & 1 \\ -1 & 2 & 5 \end{bmatrix}_{2 \times 3}$  and  $B = \begin{bmatrix} 2 & -3 & 6 \\ -3 & 1 & -4 \end{bmatrix}_{2 \times 3}$ , find  $5A - 3B$ .

4. If  $A = \begin{bmatrix} 4 & -2 \\ 6 & 1 \\ -3 & 5 \end{bmatrix}_{3 \times 2}$  and  $B = \begin{bmatrix} 2 & -3 & 5 \\ -1 & -2 & 0 \end{bmatrix}_{2 \times 3}$ , find  $A \times B$ .

5. Find  $A^{-1}$ , if  $A = \begin{bmatrix} 1 & -3 \\ 2 & -8 \end{bmatrix}_{2 \times 2}$ .

6. Find  $A^{-1}$ , if  $A = \begin{bmatrix} 1 & -1 & 1 \\ 0 & 2 & -1 \\ 2 & 3 & 0 \end{bmatrix}_{3 \times 3}$ .

7. Supposed  $A = \begin{bmatrix} 3 & 2 & 6 \\ 1 & 1 & 2 \\ 2 & 2 & 5 \end{bmatrix}_{3 \times 3}$  Then  $A^{-1} = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}_{3 \times 3}$

$$3x + 2y + 6z = 10$$

Use these facts to solve:  $x + y + 2z = -6$  by using  $A^{-1}$  and matrix multiplication.

$$2x + 2y + 5z = 3$$

8. Find the determinant of A if  $A = \begin{bmatrix} 6 & -7 \\ 1 & -3 \end{bmatrix}_{2 \times 2}$

9. Find the determinant of A if  $A = \begin{bmatrix} -4 & 0 & 0 \\ 2 & 1 & 4 \\ -2 & 5 & -1 \end{bmatrix}_{3 \times 3}$

10. Solve the system for z only using Cramer's Rule.

$$x + y + z = 0$$

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

$$-x + 3y - z = -8$$

## Answer Sheet

1.  $x = 5, y = -1, z = 2$

2.  $z = \text{any real \#}, x = 5 - 13z, y = 5z$

3.  $\begin{bmatrix} 9 & 14 & -13 \\ 4 & 7 & 37 \end{bmatrix}_{2 \times 3}$

4.  $\begin{bmatrix} 10 & -8 & 20 \\ 11 & -20 & 30 \\ -11 & -1 & -15 \end{bmatrix}_{3 \times 3}$

5.  $A^{-1} = \begin{bmatrix} 4 & -3/2 \\ 1 & -1/2 \end{bmatrix}_{2 \times 2}$

6.  $A^{-1} = \begin{bmatrix} 3 & 3 & -1 \\ -2 & -2 & 1 \\ -4 & -5 & 2 \end{bmatrix}_{3 \times 3}$

7.  $x = -8, y = -28, z = 15$

8.  $-11$

9.  $84$

10.  $z = 7$