

**Math 185 – Assignment #5****Name:** \_\_\_\_\_

1. Find, if possible,  $A+B$ ,  $AB$ , and  $BA$ . If the result is undefined, say so.

a)  $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}, B = \begin{bmatrix} -3 & -2 \\ 4 & 2 \end{bmatrix}$

b)  $A = \begin{bmatrix} 3 \\ 2 \\ -1 \end{bmatrix}, B = [-4 \ 6 \ 2]$

c)  $A = \begin{bmatrix} 1 & 2 & 0 \\ -1 & 0 & 3 \end{bmatrix}, B = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$

2. Find the inverse of the following matrices (if the inverse exists).

a)  $\begin{bmatrix} 2 & -1 \\ 3 & 5 \end{bmatrix}$

b)  $\begin{bmatrix} 0.1 & 0.6 \\ -2 & -12 \end{bmatrix}$

c)  $\begin{bmatrix} 2 & 4 & 5 \\ 0 & 1 & 4 \\ 0 & 0 & -1 \end{bmatrix}$

d)  $\begin{bmatrix} 3 & 5 & 8 \\ 1 & 0 & 1 \end{bmatrix}$

3. Use an inverse matrix to solve, if possible, the following systems of linear equations. Show your work!

a)  $\begin{aligned} -x + y &= 4 \\ 2x - 4y &= -34 \end{aligned}$

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b)  $\begin{aligned} x - 3y &= 5 \\ -2x + 6y &= -10 \end{aligned}$

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$$2x + 4y + 5z = 3$$

$$y + 4z = -1$$

c)  $-z = 4$  (hint: use your answer for 2c) \_\_\_\_\_

$$x - 3y + 2z = -11$$

d)  $2x - 4y + 3z = -15$  \_\_\_\_\_

$$3x - 5y - 4z = 5$$

4. Find the determinant of the following matrices.

a) 
$$\begin{bmatrix} 1 & 0 & 6 \\ 0 & 1 & -3 \\ 0 & 0 & 8 \end{bmatrix}$$

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b) 
$$\begin{bmatrix} -2 & 1 & 3 \\ -1 & 4 & 2 \\ 2 & 1 & 2 \end{bmatrix}$$

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5. Solve the following system using Cramer's Rule and show your work!

$$0.6x + 0.5y = 19$$

$$0.5x - 0.25y = 7$$

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