MATH 117: HW # 7

Instructor: Joseph McGuire

Due: 11/16/2020 11:59pm

Please show your work for the following problems. These problems have solutions that are easily found online, so most of your grade will be based on explaining how we get the solution that we get. You can use a calculator as long as you show the setup of the equation.

1

Solve the system of linear equations. Show your work.

$$\begin{cases} 4x - 3y + z & = -8 \\ -2x + 7 - 3z & = -4 \\ x - y + 2z & = 3 \end{cases}.$$

2

Determine whether the system of linear equations is inconsistent or dependent. If it's dependent, find the complete solution. Show your work.

2.1

$$\begin{cases} 2x + y - 2z & = 12 \\ -x - \frac{1}{2}y + z & = -6 \\ 3x + \frac{3}{2}y - 3z & = 18 \end{cases}.$$

2.2

$$\begin{cases} x + 4y - 2z & = -3 \\ 2x - y + 5z & = 12 \\ 8x + 5y + 11z & = 30 \end{cases}.$$

3

Perform the matrix operations, or if it's impossible explain why. Show your work.

3.1

$$\begin{bmatrix} 2 & -3 \\ 0 & 1 \\ 1 & 2 \end{bmatrix} \begin{bmatrix} 5 \\ 1 \end{bmatrix}$$

3.2

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

4

Let A, B be 2×2 matrices, prove

$$(A + B)^2 = A^2 + AB + BA + B^2.$$

Give an example of the above.

5

Give an example not covered in class or in the textbook where

$$AB \neq BA.$$