Test 1 Review

1. Given the following matrices

$$A=\begin{bmatrix}2 & -1 & 0\\ 4 & 9 & 5\\ -3 & -6 & 1\end{bmatrix},\quad B=\begin{bmatrix}9 & 3\\ -4 & 0\\ 0 & -2\end{bmatrix},\quad C=\begin{bmatrix}0 & 6 & -5\\ 11 & -10 & -4\\ 2 & 0 & 0\end{bmatrix},\quad d=\begin{bmatrix}3 & -2 & x\end{bmatrix}$$

find the following

a. dimensions of A
b. dimensions of d
c. A + C (if it exists)
d. B + 3d (if it exists)
e. AB (if it exists)
f. dC (if it exists)
g. 2C-A (if it exists)
h. a matrix X such that XA = AX = A
i. a matrix Y such that B + Y = Y + B = B
j. B_{21}
k. A_{32}

2. Solve the system of equations

a. 5x + 10y = 20
x + 4y = 6

b. x + 3y = 11
3x + 6y + z = 27
2y + 8z = 4

c. 5x + 25y = -30
x + 9y = -10
3x + 6y = -9

d. 2x + 4y – 3z = 5
-x –2y +4z = -5

3. Find the inverses of these matrices if it exists

a. $A=\begin{bmatrix}4 & 3\\ -2 & -1\end{bmatrix}$ b. $A=\begin{bmatrix}3 & -1 & 1\\ 2 & 1 & 0\\ 1 & 2 & -1\end{bmatrix}$ c. $A=\begin{bmatrix}2 & 1\\ 6 & 3\end{bmatrix}$ d. $A=\begin{bmatrix}3 & 4 & -1\\ 98 & 762 & 43\end{bmatrix}$

4. Given the equation AX=B, where B is given below, use the inverse of A to find X.

a. $A^{-1}=\begin{bmatrix}4 & 3\\ -2 & -1\end{bmatrix}, B=\begin{bmatrix}1\\ -1\end{bmatrix}$ b. $A^{-1}=\begin{bmatrix}1 & 0 & 2\\ 4 & 1 & 2\\ 0 & 2 & 0\end{bmatrix}, B=\begin{bmatrix}2\\ 1\\ -2\end{bmatrix}$

c. $A^{-1}=\begin{bmatrix}4 & 3\\ -2 & -1\end{bmatrix}, B=\begin{bmatrix}2 & 3 & 1\\ 4 & -3 & 0\end{bmatrix}$

5. a. Find all values of x and y that satisfy the matrix equation

$$[x \quad y]\begin{bmatrix}.2 & .8\\ .4 & .6\end{bmatrix}=\begin{bmatrix}x & y\end{bmatrix}$$

b. If, in addition, x+y=2, then find x and y.

6. Section 2.2 problems 5,7,9
7. Section 2.3 problems 3, 7, 15, 17