

Math 235 HW #2

1.3 #10, 19, 38,

1.4 6b, ~~14~~

1.3 #10

$$(5D)(4B) = 20 \text{ DB}$$

$$= 20 \begin{bmatrix} -4 & 2 \\ 3 & 5 \\ -1 & -3 \end{bmatrix} \begin{bmatrix} 4 & 1 & -2 \\ 5 & -1 & 3 \end{bmatrix}$$

$$= 20 \begin{bmatrix} -6 & -6 & 14 \\ 37 & -2 & 9 \\ -19 & 2 & -7 \end{bmatrix}$$

$$= \begin{bmatrix} -120 & -120 & 280 \\ 740 & -40 & 180 \\ -380 & 40 & -140 \end{bmatrix}$$

I am the master of adding

1.3 #19

$$\vec{x} = [-2 \ 3 \ -1] \quad \vec{y} = \begin{bmatrix} 4 \\ -1 \\ 3 \end{bmatrix}$$

$$\vec{x}\vec{y} = [-2 \ 3 \ -1] \begin{bmatrix} 4 \\ -1 \\ 3 \end{bmatrix} = \del{-14} [-14]$$

$$\vec{y}\vec{x} = \begin{bmatrix} 4 \\ -1 \\ 3 \end{bmatrix} [-2 \ 3 \ -1] = \begin{bmatrix} -8 & -12 & -4 \\ 2 & 3 & 1 \\ -6 & -9 & -3 \end{bmatrix}$$

1.3 #38

Show  $A + A^T$  is symmetric.

WTS  $(A + A^T)^T = A + A^T$ .

Here it is:

$$(A + A^T)^T = A^T + A^{TT} = A^T + A = A + A^T \quad \checkmark$$

1.4 #6b

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

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

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

$$\rightarrow \begin{bmatrix} 1 & 2 & 0 & 5/2 & 1/2 & 3/2 \\ 0 & 0 & 1 & 2 & -1 & 4 \\ 0 & 0 & 0 & 1 & -1 & 3 \end{bmatrix}$$

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

1.4 #14

$$4x_1 - 3x_2 = 10$$

$$8x_1 - x_2 = 10$$

$$\left[ \begin{array}{cc|c} 4 & -3 & 10 \\ 8 & -1 & 10 \end{array} \right] \rightarrow \left[ \begin{array}{cc|c} 4 & -3 & 10 \\ 0 & 5 & -10 \end{array} \right]$$

$$5x_2 = -10$$

$$\Rightarrow x_2 = -2$$

$$4x_1 - 3x_2 = 10$$

$$4x_1 + 6 = 10$$

$$x_1 = 1$$

$$\boxed{\begin{array}{l} x_1 = 1 \\ x_2 = -2 \end{array}}$$