Homework 2 Part 1

Problem 1 : $A = \begin{pmatrix} 7 & -2 \\ 1 & 3 \end{pmatrix}$, $B = \begin{pmatrix} 2 & 1 \\ 4 & -1 \end{pmatrix}$

$$A+2B = \begin{pmatrix} 11 & 0 \\ 9 & 1 \end{pmatrix} \quad , \quad 2A-3B = \begin{pmatrix} 8 & -7 \\ -10 & 9 \end{pmatrix}$$

Problem 2 :

$$a\begin{pmatrix} 1 \\ 4 \end{pmatrix} + b\begin{pmatrix} -2 \\ 7 \end{pmatrix} = \begin{pmatrix} 8 \\ -13 \end{pmatrix} \Rightarrow \begin{pmatrix} a-2b \\ 4a+7b \end{pmatrix} = \begin{pmatrix} 8 \\ -13 \end{pmatrix}$$

$$\begin{cases} a-2b=8 \\ 4a+7b=-13 \end{cases}$$

Solve for a: $a = 8+2b$

Substitute into second eqn…: $4(8+2b)+7b = -13$

Simplify:

$$32+15b = -13$$
$$15b = -45$$
$$b = -3$$

Now plug back into the equation for a:

$$a = 8+2(-3)$$
$$a = 2$$

Thus $a=2$, $b=-3$.

$$2\begin{pmatrix} 3 & -1 \\ 2 & 5 \end{pmatrix} + X = \begin{pmatrix} 1 & 7 \\ 3 & -4 \end{pmatrix}$$

$$\begin{pmatrix} 6 & -2 \\ 4 & 10 \end{pmatrix} + X = \begin{pmatrix} 1 & 7 \\ 3 & -4 \end{pmatrix}$$

$$X = \begin{pmatrix} 1 & 7 \\ 3 & -4 \end{pmatrix} - \begin{pmatrix} 6 & -2 \\ 4 & 10 \end{pmatrix} = \begin{pmatrix} -5 & 9 \\ -1 & -14 \end{pmatrix}$$