14.1 Notes: Matrix Addition & Scalar Multiplication

ex 1: Given matrices $A = \begin{bmatrix} 3 & -5 & 7 \\ 2 & 8 & -4 \end{bmatrix}$ $B = \begin{bmatrix} 0 & 1 & 3 \\ -2 & 4 & 7 \end{bmatrix}$ & $C = \begin{bmatrix} 5 & -1 \end{bmatrix}$

with dimensions (n(rows) by n(columns)) 2 x 3 | 2 x 3 | 1 x 2

denoted $A_{2 \times 3}$ | $B_{2 \times 3}$ | $C_{1 \times 2}$

Find elements: $a_{12} =$ ___ $a_{21} =$ ___ $b_{13} =$ ___ $b_{23} =$ ___ $c_{11} =$ ___

Evaluate: (a) $A + B =$

(b) T / F : $A + B = B + A$

(c) $A - B$

(d) T / F : $A - B = B - A$

(e) $A + C =$

Evaluate: (f) $-C =$

(g) $2A + 3B =$

* Transpose "t" means switch rows & columns

(h) $A^t =$

(i) $B^t =$

(j) $C^t =$

(k) T / F : $A^t + B^t = (A + B)^t$

ex 2: Solve:

(a) $\begin{bmatrix} a & b \\ c & d \end{bmatrix} - \begin{bmatrix} 2 & -3 \\ 5 & -1 \end{bmatrix} = \begin{bmatrix} 7 & 4 \\ -1 & 0 \end{bmatrix}$

(b) $\begin{bmatrix} 3x & y+1 \\ z-2 & w/5 \end{bmatrix} = \begin{bmatrix} 12 & -7 \\ 8 & 4 \end{bmatrix}$

ex 3: Each Auto Zone store has a certain number of cans of motor oil in inventory. In the computer data systems for the Yorba Linda & Fullerton stores, suppose inventory is organized in stock matrices:

Yorba Linda Inventory

LowTemp/HighTemp Viscosity

	5-25	10-30	20-50
Penzoil	80	70	30
Castrol	120	130	90
Valvoline	10	110	70

Fullerton Inventory

5-25	10-30	20-50
60	90	20
110	140	90
50	30	70

If all Auto Zone locations were to arrange their data this way, ...

(a) what might be an advantage?

(b) how would you increase Y.L.'s inventory by 50%?

(c) how would you transfer 20% of Fullerton's inventory to Y.L.?