MATRICES

Continued...

Recall from yesterday!

$$\begin{pmatrix} 2 & 3 & -4 \\ 1 & -2 & 5 \\ 0 & 4 & 1 \end{pmatrix}$$

The dimensions of this matrix are: 3x3

The entries in row 2 are: 1 -2 5

The entries in column 3 are: -4 5 1

$$\mathbf{A} = \begin{pmatrix} 3 & -1 \\ 0 & 4 \end{pmatrix} \qquad \mathbf{B} = \begin{pmatrix} 0 & 1 \\ 3 & 0 \end{pmatrix} \qquad \mathbf{C} = \begin{pmatrix} -3 & 0 \\ -1 & -2 \end{pmatrix}$$

Find B+C

$$\begin{pmatrix} 0 & 1 \\ 3 & 0 \end{pmatrix} + \begin{pmatrix} -3 & 0 \\ -1 & -2 \end{pmatrix}$$

$$= \begin{pmatrix} -3 & 1 \\ 2 & -2 \end{pmatrix}$$

A – B

$$\begin{pmatrix} 3 & -1 \\ 0 & 4 \end{pmatrix} - \begin{pmatrix} 0 & 1 \\ 3 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 3 & -1 \\ 0 & 4 \end{pmatrix} + \begin{pmatrix} 0 & -1 \\ -3 & 0 \end{pmatrix}$$

$$= \begin{pmatrix} 3 & -2 \\ -3 & 4 \end{pmatrix}$$

Scalar Multiplication

- **Simply multiply every entry in the matrix by the number (called a scalar) outside the bracket.**

$$2\begin{pmatrix} 2 & 3 & -4 \\ 1 & -2 & 5 \\ 0 & 4 & 1 \end{pmatrix} = \begin{pmatrix} 4 & 6 & -8 \\ 2 & -4 & 10 \\ 0 & 8 & 2 \end{pmatrix}$$

$$\mathbf{A} = \begin{pmatrix} 3 & -1 \\ 0 & 4 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} 0 & 1 \\ 3 & 0 \end{pmatrix} \quad \mathbf{C} = \begin{pmatrix} -3 & 0 \\ -1 & -2 \end{pmatrix}$$

Find $3\mathbf{A} + 2\mathbf{B}$

$$3\begin{pmatrix} 3 & -1 \\ 0 & 4 \end{pmatrix} + 2\begin{pmatrix} 0 & 1 \\ 3 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 9 & -3 \\ 0 & 12 \end{pmatrix} + \begin{pmatrix} 0 & 2 \\ 6 & 0 \end{pmatrix}$$

$$= \begin{pmatrix} 9 & -1 \\ 6 & 12 \end{pmatrix}$$

$$\mathbf{A} = \begin{pmatrix} 3 & -1 \\ 0 & 4 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} 0 & 1 \\ 3 & 0 \end{pmatrix} \quad \mathbf{C} = \begin{pmatrix} -3 & 0 \\ -1 & -2 \end{pmatrix}$$

3C-2A

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

$$3\begin{pmatrix} -3 & 0 \\ -1 & -2 \end{pmatrix} + 2\begin{pmatrix} -3 & +1 \\ 0 & -4 \end{pmatrix}$$

$$\begin{pmatrix} -9 & 0 \\ -3 & -6 \end{pmatrix} + \begin{pmatrix} -6 & 2 \\ 0 & -8 \end{pmatrix}$$

$$= \begin{pmatrix} -15 & 2 \\ -3 & -14 \end{pmatrix}$$

Solve for "x"... your answer should be a 2x2 matrix.

$$2X + \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 6 & 5 \\ 7 & 8 \end{pmatrix}$$

$$2\begin{pmatrix} 3 & 2 \\ 3 & 4 \end{pmatrix} + \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} = \begin{pmatrix} 6 & 5 \\ 7 & 8 \end{pmatrix}$$

$$X = \begin{pmatrix} 3 & 2 \\ 3 & 4 \end{pmatrix}$$