$5x\text{-}2y \le 75$

$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$S = Pe^{rt}$

$APY = (1 + \frac{r}{n})^{n}\text{-}1$

Math 1090 ~ Business Algebra

Section 2.2 Matrix Multiplication

Objectives:
- Determine whether two matrices can be multiplied together.
- Multiply two matrices.
- Write an Identity matrix of the proper size.

<u>Definitions</u>

<u>Matrix Multiplication</u> AB

Given A (size m x n) and B (size n x p) AB is an m x p matrix with ij entry given by $a_{i1}b_{1j} + a_{i2}b_{2j} + ... + a_{in}b_{nj}$. i.e. the product/sum of the ith row of A with the jth column of B.

<u>Identity Matrix</u> I

I is always a square matrix which has 1 in each diagonal entry and zeros everywhere else.

<u>Properties of Matrix Multiplication</u>
1. (AB)C = A(BC)
2. A(B + C) = AB + AC
3. (B + C)A = BA + CA
4. $(AB)^{T} = B^{T}A^{T}$

AB $\ne$ BA

Ex 1: Given $A = \begin{bmatrix} 1 & 0 & 4 \\ 5 & 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ 3 & -2 \\ -1 & 0 \end{bmatrix}$

Find AB and BA, if possible.

Ex 2: Is $(AA^T)^T = A^T A$?

Ex 3: Given $A = \begin{bmatrix} 0 & 1 & 3 \\ 2 & 0 & 1 \\ 0 & 0 & -4 \end{bmatrix}$, find A^2.

Ex 4: Solve for x.

$$\begin{bmatrix} -5 \\ 10 \\ -19 \end{bmatrix} + \begin{bmatrix} -2x \\ 13 \\ -8 \end{bmatrix} + \begin{bmatrix} -8 \\ -4 \\ -7 \end{bmatrix} = \begin{bmatrix} 5 \\ 19 \\ -34 \end{bmatrix}$$

Ex 5: Solve for x and y.

$$\begin{bmatrix} 1 & 3 \\ -1 & 5 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 11 \\ 5 \end{bmatrix}$$