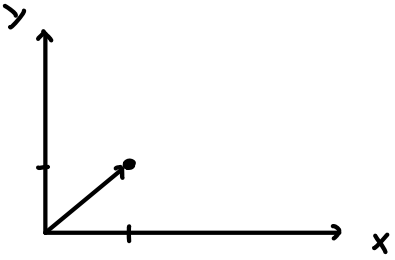
Name: _____ **ESMI Applied Math**
Due: 06/07 **Worksheet 1**

Problem 1. Let $u = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$ and $v = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$. Compute and plot the following:

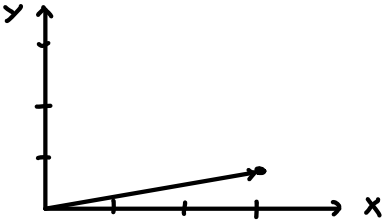
(a) $u + v$

$\begin{bmatrix} 1 \\ 1 \end{bmatrix}$



(b) $3u + v$

$\begin{bmatrix} 3 \\ 1 \end{bmatrix}$



Problem 2. If matrix A is of size 2×7 and matrix B is of size 3×2, what is the size of the matrix-matrix multiplication $A \cdot B$? What is the size of matrix-matrix multiplication $B \cdot A$? Is one of these impossible to compute?

$A \cdot B$ is impossible to compute because L: 2×7, R: 3×2

size of $B \cdot A$ is 3×7.

Problem 3. Let $A = \begin{bmatrix} 3 & 2 \\ 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 1/2 & -1 \\ 0 & 3 \end{bmatrix}$. Compute the following:

(a) $A + B$

$\begin{bmatrix} 3.5 & 1 \\ 2 & 8 \end{bmatrix}$

(b) $3B$

$\begin{bmatrix} 3/2 & -3 \\ 0 & 9 \end{bmatrix}$

(c) B^2 On worksheet 2

Problem 4. Let $G = \begin{bmatrix} 1/2 & 2 \\ 2 & -3 \end{bmatrix}$ and $H = \begin{bmatrix} 2 & 10 & 2 \\ -10 & 3 & -5 \end{bmatrix}$. Compute the matrix-matrix product $G \cdot H$.

On worksheet 2

Problem 5. Draw two networks different from the ones presented in class. You have free range with this problem but make sure that each of the nodes have a physical meaning (i.e. each of the nodes should be a different person/animal/city/etc.) and the edges correspond to connections between those nodes. If you are not sure what to draw, try drawing a network with some of the biggest airports in the US as the nodes and figure out what appropriate edges could correspond to.

example) Network of cheap flights to and from big cities in the United states.