MA 110 Dr. Katiraie

**SECTION 4.4 MATRICES** 

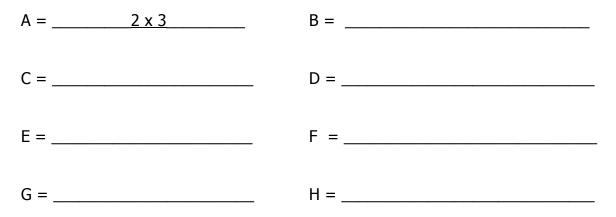
A matrix is a two-dimensional "storage system". Several examples are listed:

$$A = \begin{bmatrix} 1 & 7 & 9 \\ -3 & 0 & 5 \end{bmatrix} B = \begin{bmatrix} 1 & 3 \\ 2 & -4 \end{bmatrix} C = \begin{bmatrix} 5 & -3 \\ 1 & 4 \\ 0 & -2 \\ 3 & -3 \end{bmatrix} D = \begin{bmatrix} -2 & 0 & 3 \\ 1 & -1 & 2 \\ 0 & 4 & -5 \end{bmatrix}$$
$$E = \begin{bmatrix} 0 \\ -1 \\ 7 \end{bmatrix} F = 3 -9 4 G = \begin{bmatrix} a & b \\ c & d \end{bmatrix} H = \begin{bmatrix} 2 & -3 \\ -2 & 4 \end{bmatrix}$$

Matrices have rows ( $\leftrightarrow$ ) and columns ( $\updownarrow$ ). The size of a matrix is given by stating its row and column dimensions in the following format: row dimension x column dimension.

Matrix A (above) is a 2 x 3 matrix (Read 2 by 3) since A has 2 rows and 3 columns.

List the sizes of the remaining matrices:



Note: F is called a row matrix and E is called a column matrix.

<u>MATRIX MULTIPLICATION</u>: Two matrices can be multiplied if the number of columns in the first matrix equals the number of rows in the second matrix.

For example: B*A is possible:		A 2 x 3	The inner dimensions match
However, A*B is <b>NOT</b> possible: A 2 x 3		B 2 x 2	The inner dimensions do not match

Let's find the product B\*A (written BA).

For each of the matrix multiplications listed, explain whether or not the product is possible.

AD .	 EF
FD	 FG

Find the product CG.