

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

$$A = \begin{bmatrix} 1 & 7 & 9 \\ -3 & 0 & 5 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 3 \\ 2 & -4 \end{bmatrix} \quad C = \begin{bmatrix} 5 & -3 \\ 1 & 4 \\ 0 & -2 \\ 3 & -3 \end{bmatrix} \quad D = \begin{bmatrix} -2 & 0 & 3 \\ 1 & -1 & 2 \\ 0 & 4 & -5 \end{bmatrix}$$

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

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:

A = _____ 2 x 3 _____	B = _____
C = _____	D = _____
E = _____	F = _____
G = _____	H = _____

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

MATRIX MULTIPLICATION: 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: B A
 2 x 2 2 x 3 *The inner dimensions match*

However, A*B is **NOT** possible: A B
 2 x 3 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 .