

OPERATIONRULESEXAMPLES

Add/Subtract

\*must have the same  
-----

(Recall: # rows by # columns )

$$\begin{bmatrix} 2 & 1 \\ 4 & 5 \end{bmatrix} + \begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix} =$$

$$\begin{bmatrix} 2 & 1 & 4 \end{bmatrix} + \begin{bmatrix} 2 & 1 \\ 1 & 3 \\ 4 & 5 \end{bmatrix} =$$

Multiply

\*scalar: just distribute to every number\*matrix × matrix: -----  
of first *must* match  
----- of second

(Recall: ORDER MATTERS!!)

Scalar:  $2 \begin{bmatrix} 4 & -1 \\ 2 & 1 \end{bmatrix}$

matrix × matrix:

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

$$\begin{bmatrix} 2 & 7 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 & 1 \\ 4 & -7 \end{bmatrix}$$

Find the determinant

2×2 matrix:  $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$

(\*\*ANSWER IS A NUMBER)

$A = \begin{bmatrix} 4 & 3 \\ 5 & 7 \end{bmatrix}$  Find:  $\det A$  or  $|A|$

Find determinant  
(CONTINUED)

3×3 matrix:

1. Recopy the first 2 columns
2. Find the sum of the products of LEFT to RIGHT diagonals
3. SUBTRACT sum of the products of RIGHT to LEFT diagonals

(\*\*ANSWER IS A NUMBER)

$$\begin{vmatrix} 4 & 3 & 1 \\ 5 & 7 & 0 \\ 1 & -2 & 2 \end{vmatrix}$$

Find the inverse matrix

2×2 matrix:

If  $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$  then

$$A^{-1} = \frac{1}{|A|} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

Find  $A^{-1}$  if  $A = \begin{bmatrix} 4 & 3 \\ 5 & 7 \end{bmatrix}$