

OPERATIONRULESEXAMPLES

<u>OPERATION</u>	<u>RULES</u>	<u>EXAMPLES</u>
Add/Subtract	<p>*must have the same <u>dimensions</u></p> <p>(Recall: # rows by # columns)</p>	$\begin{bmatrix} 2 & 1 \\ 4 & 5 \end{bmatrix} + \begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix} = \begin{bmatrix} 3 & 3 \\ 7 & 10 \end{bmatrix}$ $1 \times 3 \quad 3 \times 2$ $\begin{bmatrix} 2 & 1 & 4 \end{bmatrix} + \begin{bmatrix} 2 & 1 \\ 1 & 3 \\ 4 & 5 \end{bmatrix} = \text{ }$
Multiply	<p>*<u>scalar</u>: just distribute to every number</p> <p>*<u>matrix \times matrix</u>: <u>cols.</u> of first <u>must</u> match <u>rows</u> of second</p> <p>(Recall: ORDER MATTERS!!)</p>	<p>Scalar: $2 \begin{bmatrix} 4 & -1 \\ 2 & 1 \end{bmatrix} = \begin{bmatrix} 8 & -2 \\ 4 & 2 \end{bmatrix}$</p> <p>matrix \times matrix:</p> $2 \times 3 \quad 3 \times 2$ $\begin{bmatrix} 5 & 1 & -2 \\ 2 & -3 & 0 \end{bmatrix} \cdot \begin{bmatrix} 1 & 0 \\ -1 & 2 \\ 4 & -3 \end{bmatrix} =$ $\begin{bmatrix} 5+1-8 & 0+2+6 \\ 2+3+0 & 0-6+0 \end{bmatrix}$ $\begin{bmatrix} -4 & 8 \\ 5 & -6 \end{bmatrix}$ $1 \times 3 \quad 2 \times 2$ $\begin{bmatrix} 2 & 7 & 1 \end{bmatrix} \cdot \begin{bmatrix} 2 & 1 \\ 4 & -7 \end{bmatrix} = \text{ }$
Find the determinant	<p><u>2x2 matrix</u>: $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$</p> <p>(**ANSWER IS A NUMBER)</p>	<p>$A = \begin{bmatrix} 4 & 3 \\ 5 & 7 \end{bmatrix}$ Find: $\det A$ or A</p> $\begin{vmatrix} 4 & 3 \\ 5 & 7 \end{vmatrix} = 28 - 15$ $= 13$

<p>Find determinant (CONTINUED)</p>	<p><u>3x3 matrix:</u></p> <ol style="list-style-type: none"> 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 <p>(**ANSWER IS A NUMBER)</p>	$\begin{array}{ccc cc} 4 & 3 & 1 & 4 & 3 \\ 5 & 7 & 0 & 5 & 7 \\ 1 & -2 & -2 & 1 & -2 \end{array}$ $[56 + 0 + (-10)]$ $[7 + 0 + 30]$ $46 - 37 = \boxed{9}$
<p>Find the inverse matrix</p>	<p><u>2x2 matrix:</u></p> <p>If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ then</p> $A^{-1} = \frac{1}{ A } \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$	<p>Find A^{-1} if $A = \begin{bmatrix} 4 & 3 \\ 5 & 7 \end{bmatrix}$</p> $ A = 28 - 15 = 13$ $\frac{1}{13} \begin{bmatrix} 7 & -3 \\ -5 & 4 \end{bmatrix}$ $\begin{bmatrix} \frac{7}{13} & -\frac{3}{13} \\ -\frac{5}{13} & \frac{4}{13} \end{bmatrix}$

- A^{-1} - Find in Calc
- Find det of 3×3 in Calc.
- $A - 2B$