Matrices = Matrix

[a] || 1 ||

~~α~~, β, γ elements

$A = [a]$ row, $\rightarrow \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

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$C = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ $C_{3\times 3}$

$D = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$ $D_{3\times 2}$

$F = [1\ 2\ 3\ 4\ 5]$ $F_{1\times 5}$

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Sq. matrix = rows = columns.

Transpose = interchange rows & columns

$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \quad A^T = \begin{bmatrix} a & c \\ b & d \end{bmatrix}$$

$$B = \begin{bmatrix} 1 & a & 2 & b \end{bmatrix} \quad B^T = \begin{bmatrix} 1 \\ a \\ 2 \\ b \end{bmatrix}$$

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Add/Subtract ⇒ Scalar

$$A_{2\times2} = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \quad B_{2\times2} = \begin{bmatrix} -4 & 7 \\ 11 & 2 \end{bmatrix} \quad C = \begin{bmatrix} 1 & 2 \\ 4 & 9 \\ 0 & 1 \end{bmatrix}$$

1. $A^T = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$

2. $A + B = \begin{bmatrix} 1+(-4) & 2+7 \\ 3+11 & 4+2 \end{bmatrix} = \begin{bmatrix} -3 & 9 \\ 14 & 6 \end{bmatrix}$

3. $5C = 5\begin{bmatrix} 1 & 2 \\ 4 & 9 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 5(1) & 5(2) \\ 5(4) & 5(9) \\ 5(0) & 5(1) \end{bmatrix} = \begin{bmatrix} 5 & 10 \\ 20 & 45 \\ 0 & 5 \end{bmatrix}$

↑ Scalar

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$A=\begin{bmatrix}4 & -1\\ 2 & 7\end{bmatrix}$ $B=\begin{bmatrix}6 & -3\\ 4 & -2\end{bmatrix}$

1. $A-B=A+(-1)B$

$\begin{bmatrix}4 & -1\\ 2 & 7\end{bmatrix}+(-1)\begin{bmatrix}6 & -3\\ 4 & -2\end{bmatrix}$

$\begin{bmatrix}4 & -1\\ 2 & 7\end{bmatrix}+\begin{bmatrix}-6 & +3\\ -4 & +2\end{bmatrix}=\begin{bmatrix}-2 & 2\\ -2 & 9\end{bmatrix}$

2. $4B+2A$

$4\begin{bmatrix}6 & -3\\ 4 & -2\end{bmatrix}+2\begin{bmatrix}4 & -1\\ 2 & 7\end{bmatrix}=\begin{bmatrix}24 & -12\\ 16 & -8\end{bmatrix}+\begin{bmatrix}8 & -2\\ 4 & 14\end{bmatrix}$

$\begin{bmatrix}32 & -14\\ 20 & 6\end{bmatrix}$

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$2\begin{bmatrix}4 & 7\\ -5 & 2\end{bmatrix}+3\begin{bmatrix}a & 5\\ c & d\end{bmatrix}=\begin{bmatrix}16 & -20\\ 12 & -41\end{bmatrix}$

$\begin{bmatrix}8 & 14\\ -10 & 4\end{bmatrix}+\begin{bmatrix}3a & 3b\\ 3c & 3d\end{bmatrix}=\begin{bmatrix}16 & -20\\ 12 & -41\end{bmatrix}$

$8+3a=16$

$3a=8$

$a=8/3$

$14+3b=-20$

$3b=-34$

$b=-3\frac{1}{3}$

$-10+3c=12$

$3c=+22$

$c=+22/3$

$4+3d=-41$

$3d=-45$

$d=-15$

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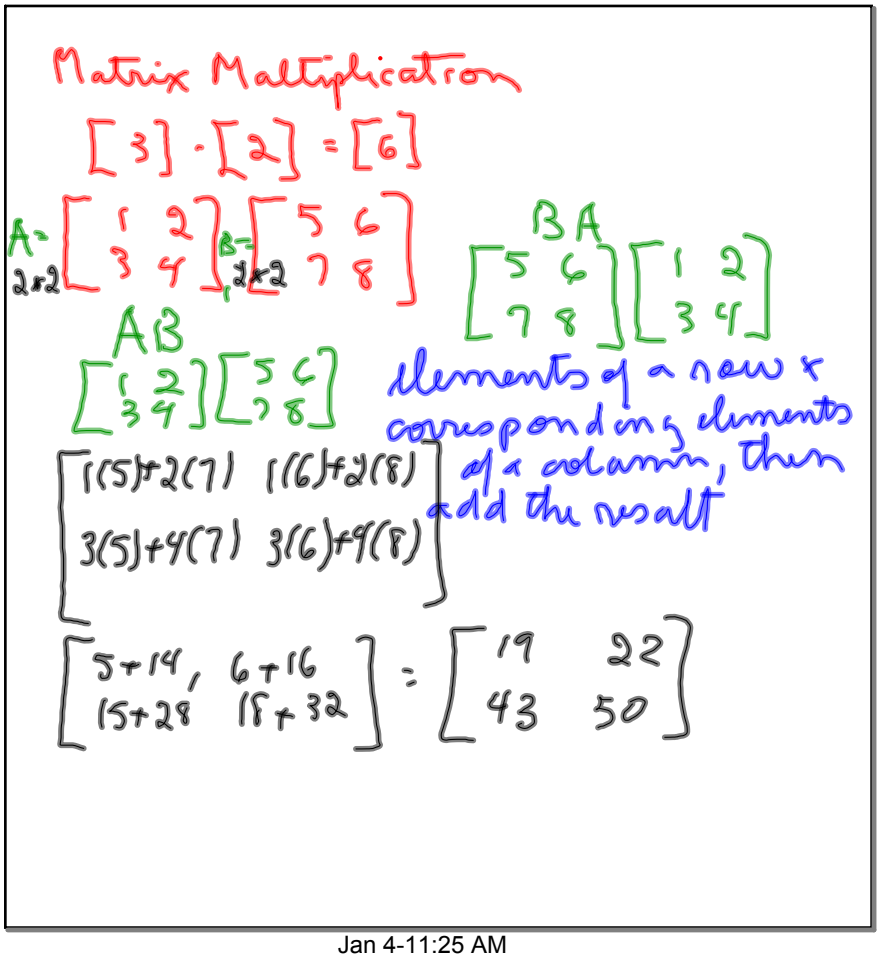

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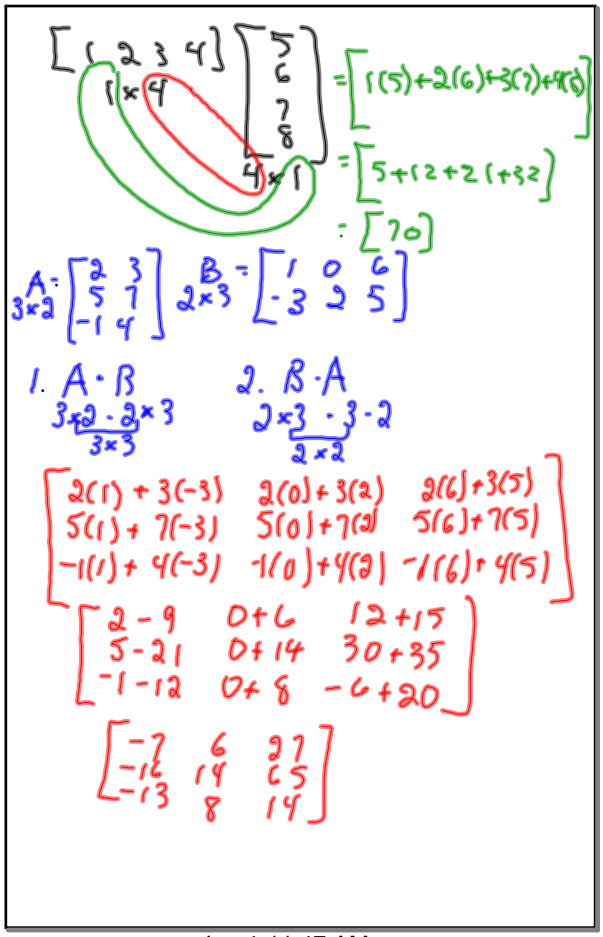

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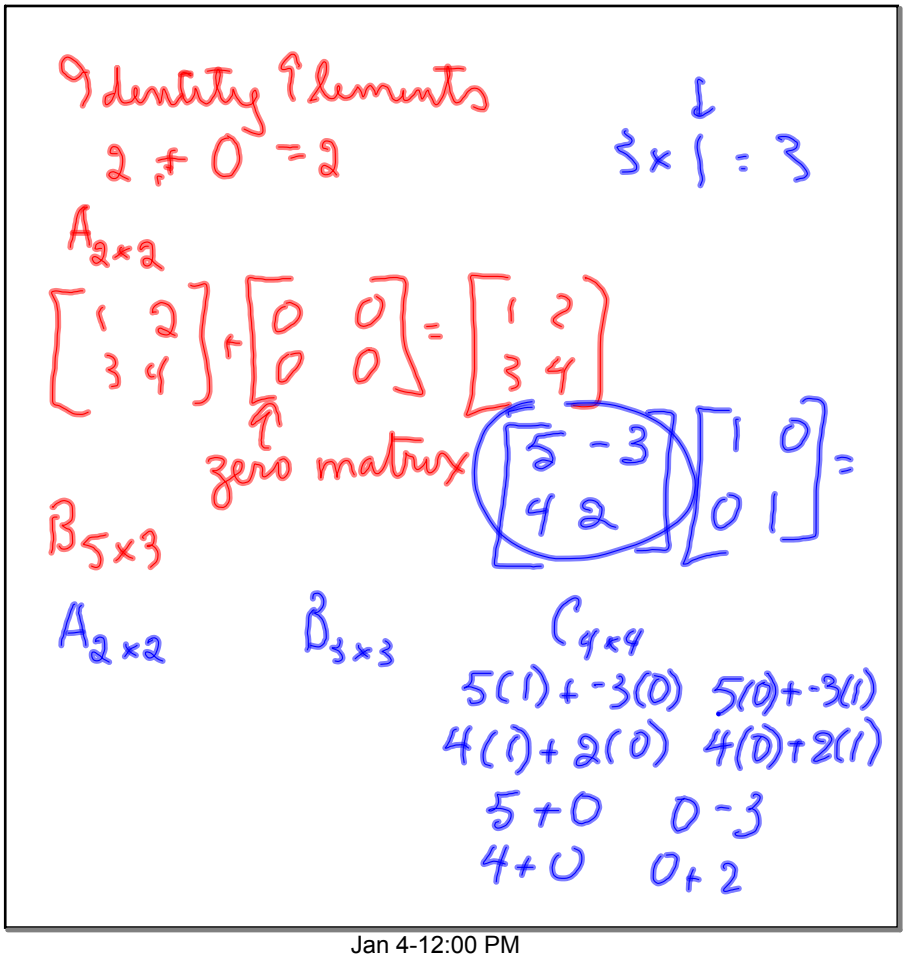
Identity Elements
2 + 0 = 2
3 x 1 = 3
A2x2
zero matrix
B5x3
A2x2
B3x3
C4x4
5(1) + -3(0) 5(0) + -3(1)
4(1) + 2(0) 4(0) + 2(1)
5 + 0 0 - 3
4 + 0 0 + 2

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