

Addition

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

Subtraction

$$\begin{bmatrix} 4, 6 \\ 5, 3 \end{bmatrix} - \begin{bmatrix} 1, 3 \\ 2, -1 \end{bmatrix} = \begin{bmatrix} 4-1, 6-3 \\ 5-2, 3-(-1) \end{bmatrix} = \begin{bmatrix} 3, 3 \\ 3, 4 \end{bmatrix}$$

Multiplication

$$\begin{bmatrix} 1, 3, 4 \\ 6, 1, 2 \end{bmatrix} \times \begin{bmatrix} 1 & 0 \\ 2 & -1 \\ 3 & -2 \end{bmatrix} = \begin{bmatrix} 1 \times 1 + 3 \times 2 + 4 \times 3, & 1 \times 0 + 3 \times -1 + 4 \times -2 \\ 6 \times 1 + 1 \times 2 + 2 \times 3, & 6 \times 0 + 1 \times -1 + 2 \times -2 \end{bmatrix}$$

$$= \begin{bmatrix} 19, -11 \\ 14, -5 \end{bmatrix}$$