

col

row

$n \times 1$

$1 \times n$

$$X = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

$$X = [x_1 \ x_2]$$

row 1 becomes row 1  
row n becomes col n

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \begin{matrix} \vec{x} \\ [5 \ 3]^T \end{matrix} = \begin{bmatrix} 5 \\ 3 \end{bmatrix}$$

$2 \times 2$

V

W

$$\begin{bmatrix} v_1 \\ v_2 \end{bmatrix}$$

$$\begin{bmatrix} w_1 \\ w_2 \end{bmatrix}$$

$$V \cdot W = V^T W$$

$$v_1 * w_1 + v_2 * w_2 = [v_1 \ v_2]$$

$$A = \begin{bmatrix} 1 & 2 \\ -3 & 1 \end{bmatrix} \rightarrow A^T = \begin{bmatrix} 1 & -3 \\ 2 & 1 \end{bmatrix}$$

$$C = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 1 & 2 \end{bmatrix} \rightarrow C^T = \begin{bmatrix} 1 & 2 \\ 2 & 1 \\ 1 & 2 \end{bmatrix}$$

$2 \times 3$

2x2

3x2

$$(A+B) = \begin{bmatrix} 2 & 3 \\ -2 & 2 \end{bmatrix}$$

$$A^T + B^T = \begin{bmatrix} 2 & -2 \\ 3 & 2 \end{bmatrix}$$

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

$$(A+B)^T = A^T + B^T$$

