

(max)

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

$$B = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$$

$$C = \begin{bmatrix} 5 & -1 \\ 9 & 1 \\ 6 & 0 \end{bmatrix}$$

$$D = \begin{bmatrix} 3 & -2 & -1 \\ 1 & 2 & 3 \end{bmatrix}$$

$$U = [6 \ 2 \ -3 \ 5]$$

$$V = [3 \ 5 \ -1 \ 4]$$

$$w = \begin{bmatrix} 1 \\ 8 \\ 0 \\ 5 \end{bmatrix}$$

write dimensions

1) a) $A = R^{2 \times 3}$

b) $B = R^{2 \times 2}$

c) $C = R^{3 \times 2}$

d) $D = R^{2 \times 3}$

e) $U = R^{1 \times 4}$

f) $w = R^{4 \times 1}$

2.) Perform following operations $\alpha = 6$

a) $\vec{u} + \vec{v} = [6+3, 2+5, -3-1, 5+4] \rightarrow [9 \ 7 \ -4 \ 9]$

b) $\vec{u} - \vec{v} = [6-3, 2-5, -3-(-1), 5-4] \rightarrow [3 \ -3 \ -2 \ 1]$

c) $\alpha \vec{u} = [36, 12, -18, 30]$

e) $\vec{u} \cdot \vec{v} = [6 \cdot 3 + 2 \cdot 5 + (-3) \cdot (-1) + 5 \cdot 4] = 51$

f) $\|\vec{u}\| = \sqrt{6^2 + 2^2 + (-3)^2 + 5^2} = \sqrt{36 + 4 + 9 + 25} = \sqrt{74}$

3.) Evaluate each of the following expressions, if it is defined

a) $A+C = \text{"not defined"}$

b) $A - C^T = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 7 & 4 \end{bmatrix} - \begin{bmatrix} 5 & 9 & 6 \\ 1 & 1 & 0 \end{bmatrix} = \begin{bmatrix} -4 & -7 & -3 \\ 3 & 6 & 4 \end{bmatrix}$

c) $(C^T + 3D) = \begin{bmatrix} 5 & 9 & 6 \\ -1 & 1 & 0 \end{bmatrix} + \begin{bmatrix} 9 & -6 & 3 \\ 3 & 6 & 9 \end{bmatrix} = \begin{bmatrix} 14 & 3 & 9 \\ 2 & 7 & 9 \end{bmatrix}$

d) $BA = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 2 & 3 \\ 2 & 7 & 4 \end{bmatrix} = \begin{bmatrix} -1 & -5 & -1 \\ 2 & 7 & 4 \end{bmatrix}$

e) $BA^T = \text{not defined}$

f) $BC = \text{not defined}$