SATISH KUMAR

Bonus Question

Exercise 1

$$\underline{u} = \begin{pmatrix} 0 \\ 2 \end{pmatrix}, \quad \underline{v} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}, \quad \underline{w} = \begin{pmatrix} 6 \\ -2 \end{pmatrix}$$

1) $$\underline{u} + \underline{v} = \begin{pmatrix} 0 \\ 2 \end{pmatrix} + \begin{pmatrix} -2 \\ 3 \end{pmatrix} = \begin{pmatrix} 0+(-2) \\ 2+3 \end{pmatrix} = \begin{pmatrix} -2 \\ 5 \end{pmatrix}$$

2) $$\underline{v} - \underline{w} = \begin{pmatrix} -2 \\ 3 \end{pmatrix} - \begin{pmatrix} 6 \\ -2 \end{pmatrix} = \begin{pmatrix} -2-6 \\ 3-(-2) \end{pmatrix} = \begin{pmatrix} -8 \\ 5 \end{pmatrix}$$

3) $$5\underline{v} = 5 \cdot \begin{pmatrix} -2 \\ 3 \end{pmatrix} = \begin{pmatrix} 5 \cdot (-2) \\ 5 \cdot 3 \end{pmatrix} = \begin{pmatrix} -10 \\ 15 \end{pmatrix}$$

4) $$-2\underline{u} + \underline{v} = -2\begin{pmatrix} 0 \\ 2 \end{pmatrix} + \begin{pmatrix} -2 \\ 3 \end{pmatrix} = \begin{pmatrix} 0 \\ -4 \end{pmatrix} + \begin{pmatrix} -2 \\ 3 \end{pmatrix} = \begin{pmatrix} -2 \\ -1 \end{pmatrix}$$

5) $$\underline{v} + \frac{1}{2}\underline{w} = \begin{pmatrix} -2 \\ 3 \end{pmatrix} + \frac{1}{2}\begin{pmatrix} 6 \\ -2 \end{pmatrix} = \begin{pmatrix} -2 \\ 3 \end{pmatrix} + \begin{pmatrix} \frac{1}{2} \cdot 6 \\ \frac{1}{2} \cdot (-2) \end{pmatrix} = \begin{pmatrix} -2 \\ 3 \end{pmatrix} + \begin{pmatrix} 3 \\ -1 \end{pmatrix}$$

$$\begin{pmatrix} -2+3 \\ 3+(-1) \end{pmatrix} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$

6) $$-\underline{u} + \underline{w} - 2\underline{u} = -1\begin{pmatrix} 0 \\ 2 \end{pmatrix} + \begin{pmatrix} 6 \\ -2 \end{pmatrix} - 2\begin{pmatrix} 0 \\ 2 \end{pmatrix}$$

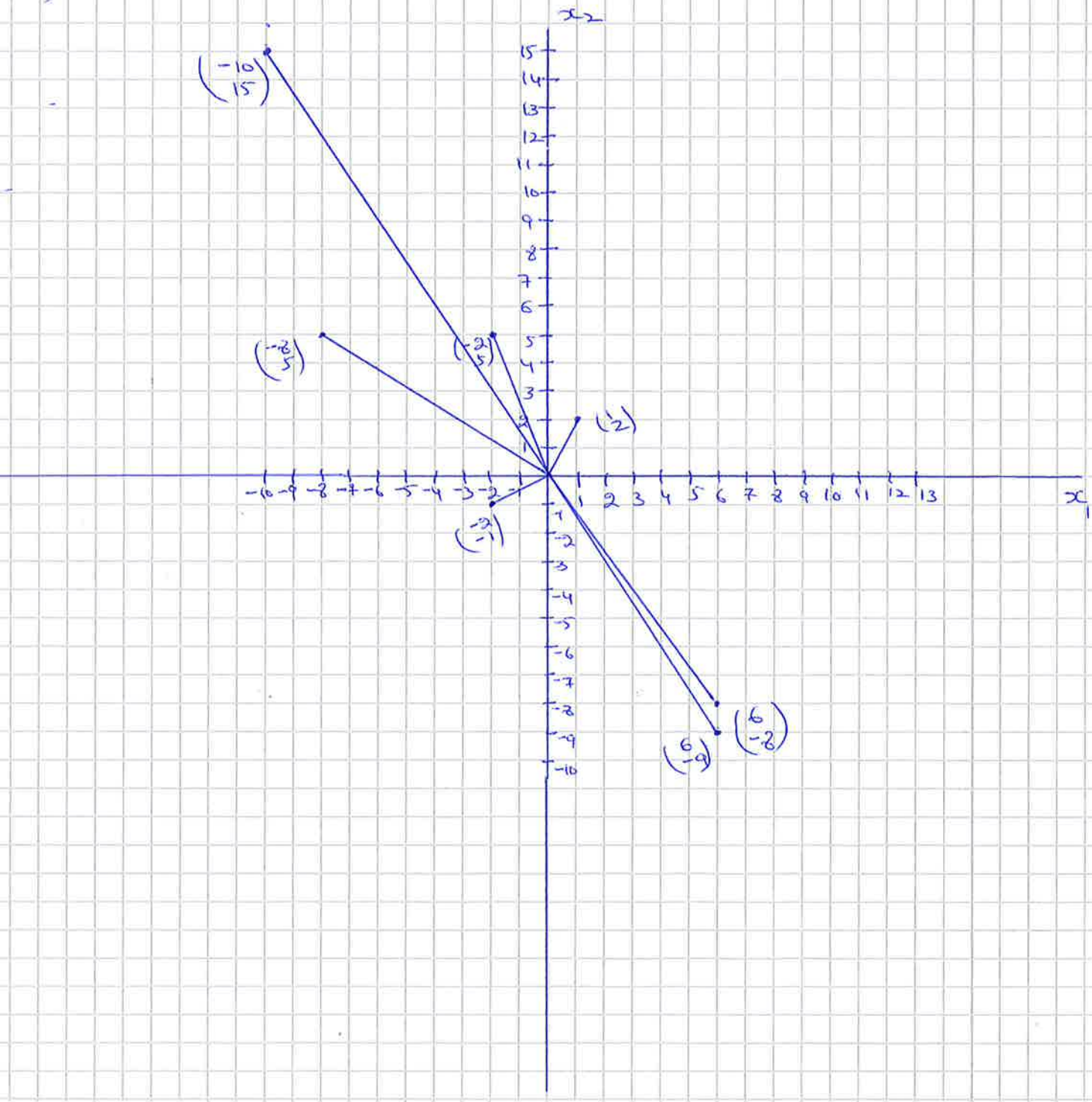
$$\begin{pmatrix} -1 \cdot 0 \\ -1 \cdot 2 \end{pmatrix} + \begin{pmatrix} 6 \\ -2 \end{pmatrix} - \begin{pmatrix} 2 \cdot 0 \\ 2 \cdot 2 \end{pmatrix} = \begin{pmatrix} 0 \\ -2 \end{pmatrix} + \begin{pmatrix} 6 \\ -2 \end{pmatrix} - \begin{pmatrix} 0 \\ 4 \end{pmatrix} = \begin{pmatrix} 0+6-0 \\ -2+(-2)-4 \end{pmatrix}$$

$$\Rightarrow \begin{pmatrix} 6 \\ -8 \end{pmatrix}$$

7)

$$-\underline{u} - 3\underline{v} + \underline{u} = -\begin{pmatrix} 0 \\ 2 \end{pmatrix} - 3\begin{pmatrix} -2 \\ 3 \end{pmatrix} + \begin{pmatrix} 0 \\ 2 \end{pmatrix} \Rightarrow \begin{pmatrix} -1 \cdot 0 \\ -1 \cdot 2 \end{pmatrix} - \begin{pmatrix} 3 \cdot (-2) \\ 3 \cdot 3 \end{pmatrix} + \begin{pmatrix} 0 \\ 2 \end{pmatrix}$$

$$\Rightarrow \begin{pmatrix} 0 \\ -2 \end{pmatrix} - \begin{pmatrix} -6 \\ 9 \end{pmatrix} + \begin{pmatrix} 0 \\ 2 \end{pmatrix} \Rightarrow \begin{pmatrix} 0 - (-6) + 0 \\ -2 - 9 + 2 \end{pmatrix} \Rightarrow \begin{pmatrix} 6 \\ -9 \end{pmatrix}$$



(b) $\underline{v} = \begin{pmatrix} 2 \\ 1 \\ 3 \\ -4 \end{pmatrix} - \begin{pmatrix} 7 \\ -2 \\ -1 \end{pmatrix}$ is Not defined because ~~it~~ vector ~~has~~ has different dimension. Mean the different number of componant.

$$\underline{w} = \begin{pmatrix} -1 \\ 3 \\ 4 \end{pmatrix} + \begin{pmatrix} 100 \\ -59 \\ 6 \end{pmatrix} \Rightarrow \begin{pmatrix} -1+100 \\ 3+(-59) \\ 4+6 \end{pmatrix} \Rightarrow \begin{pmatrix} 99 \\ -56 \\ 10 \end{pmatrix}$$