

HOMWORK ASSAIGNMENT #1

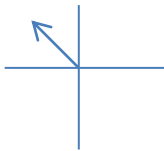
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- In exercise 3 display the following vectors using arrows on an xy-graph: $u, v, -2v, u+v, u-v, u-2v$

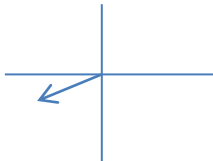
$$U = \begin{bmatrix} -1 \\ 2 \end{bmatrix} \quad V = \begin{bmatrix} -3 \\ -1 \end{bmatrix}$$

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- $U = (-1, 2)$

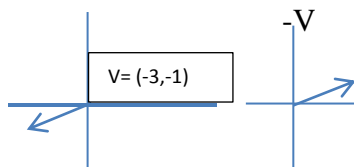


- $V = (-3, -1)$



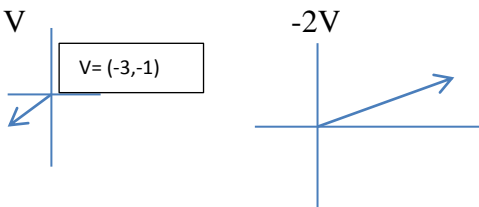
- $-V = V = - \begin{bmatrix} -3 \\ -1 \end{bmatrix} = \begin{bmatrix} 3 \\ 1 \end{bmatrix}$

V

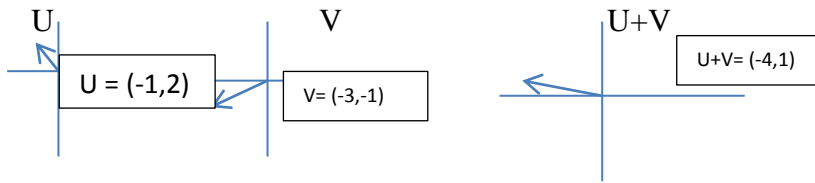


- $-2V = -2 \begin{bmatrix} -3 \\ -1 \end{bmatrix} = \begin{bmatrix} 6 \\ 2 \end{bmatrix}$

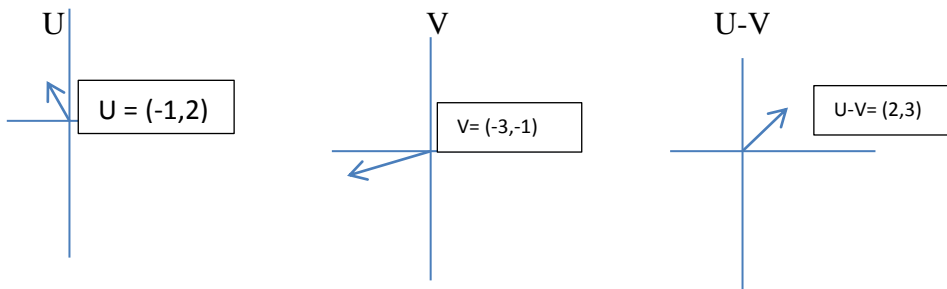
V



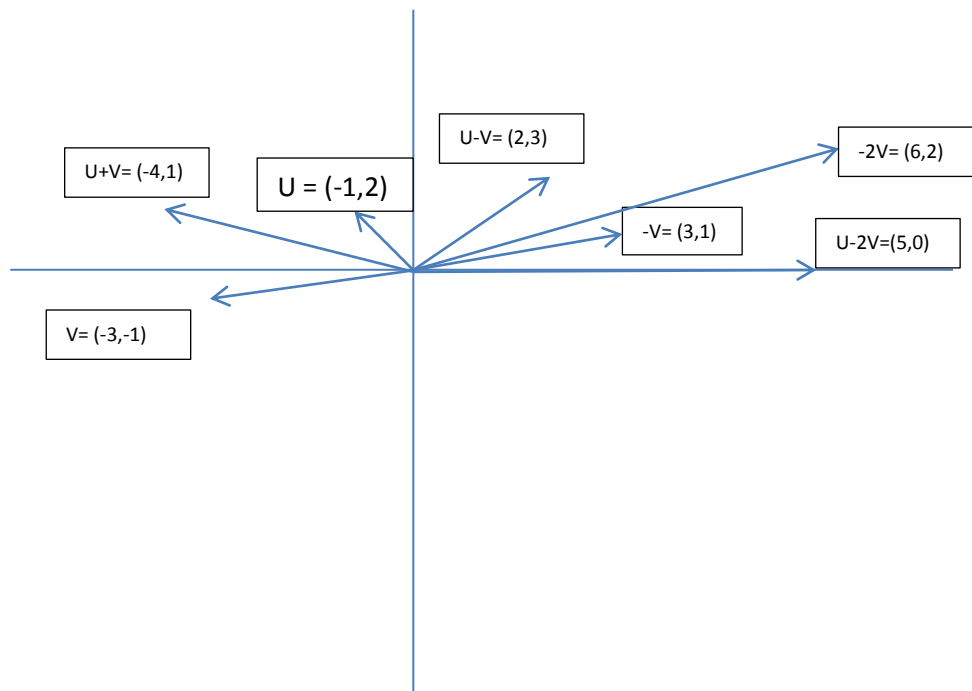
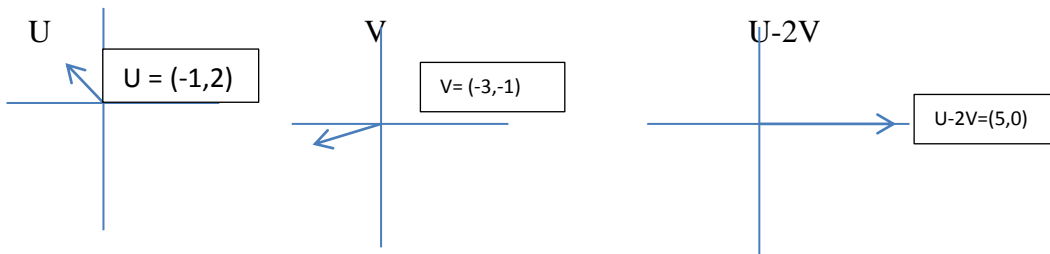
- $$U+V = \begin{bmatrix} -1 \\ 2 \end{bmatrix} + \begin{bmatrix} -3 \\ -1 \end{bmatrix} = \begin{bmatrix} (-1) + (-3) \\ (2) + (-1) \end{bmatrix} = \begin{bmatrix} -4 \\ 1 \end{bmatrix}$$



- $$U-V = \begin{bmatrix} -1 \\ 2 \end{bmatrix} - \begin{bmatrix} -3 \\ -1 \end{bmatrix} = \begin{bmatrix} (-1) - (-3) \\ (2) - (-1) \end{bmatrix} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$$



- $$U-2V = \begin{bmatrix} -1 \\ 2 \end{bmatrix} - (2) \begin{bmatrix} -3 \\ -1 \end{bmatrix} = \begin{bmatrix} (-2)(-3) \\ (-2)(-1) \end{bmatrix} = \begin{bmatrix} 6 \\ 2 \end{bmatrix} = \begin{bmatrix} -1 \\ 2 \end{bmatrix} - \begin{bmatrix} 6 \\ 2 \end{bmatrix} = \begin{bmatrix} 5 \\ 0 \end{bmatrix}$$



- In exercise 1 compute each matrix sum or product if it is defined. If an expression is undefined, explain.

$$A = \begin{bmatrix} 2 & 0 & -1 \\ 4 & -5 & 2 \end{bmatrix}; B = \begin{bmatrix} 7 & -5 & 1 \\ 1 & -4 & -3 \end{bmatrix}; C = \begin{bmatrix} 1 & 2 \\ -2 & 1 \end{bmatrix}; D = \begin{bmatrix} 3 & 5 \\ -1 & 4 \end{bmatrix}$$

- $-2A = (-2)A = \begin{bmatrix} 2 & 0 & -1 \\ 4 & -5 & 2 \end{bmatrix} = \begin{bmatrix} (-2)(2); (0)(-2); (-2)(-1) \\ (-2)(4); (-2)(-5); (-2)(2) \end{bmatrix} = \begin{bmatrix} -4 & 0 & 2 \\ -8 & 10 & -4 \end{bmatrix}$

- $B - 2A = B - \begin{bmatrix} 2 & 0 & -1 \\ 4 & -5 & 2 \end{bmatrix} = \begin{bmatrix} 7 & -5 & 1 \\ 1 & -4 & -3 \end{bmatrix} - \begin{bmatrix} -4 & 0 & 2 \\ -8 & 10 & -4 \end{bmatrix} = \begin{bmatrix} 3 & -5 & 3 \\ -7 & 6 & -7 \end{bmatrix}$

***-2A came from above

- $AC =$ Size difference $A=(2 \times 3)$; $C=(2 \times 2) =$ UNDEFINED because 3 is not equal (\neq) to 2

- $CD = C \times D = \begin{bmatrix} 1 & 2 \\ -2 & 1 \end{bmatrix} \times \begin{bmatrix} 3 & 5 \\ -1 & 4 \end{bmatrix} = \begin{bmatrix} (1)(3) + (2)(-1); (1)(5) + (2)(4) \\ (-2)(3) + (1)(-1); (-2)(5) + (1)(4) \end{bmatrix} = \begin{bmatrix} 1 & 13 \\ -7 & -6 \end{bmatrix}$