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HOMEWORK ASSAIGNMENT #1

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In Exercises 1 and 2, compute $\mathbf{u} + \mathbf{v}$ and $\mathbf{u} - 2\mathbf{v}$.

1. $\mathbf{u} = \begin{bmatrix} -1 \\ 2 \end{bmatrix}, \mathbf{v} = \begin{bmatrix} -3 \\ -1 \end{bmatrix}$ 2. $\mathbf{u} = \begin{bmatrix} 3 \\ 2 \end{bmatrix}, \mathbf{v} = \begin{bmatrix} 2 \\ -1 \end{bmatrix}$

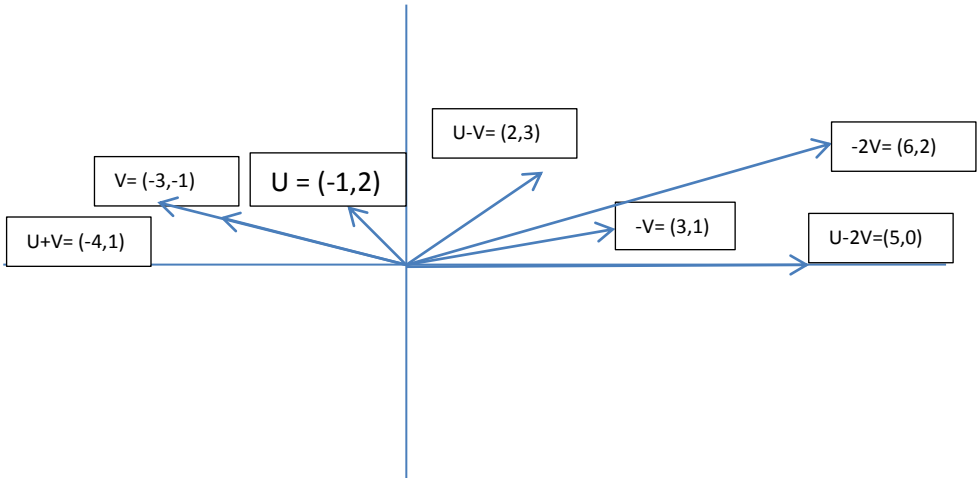
In Exercises 3 and 4, display the following vectors using arrows on an xy-graph: $\mathbf{u}$, $\mathbf{v}$, $-\mathbf{v}$, $-2\mathbf{v}$, $\mathbf{u} + \mathbf{v}$, $\mathbf{u} - \mathbf{v}$, and $\mathbf{u} - 2\mathbf{v}$. Notice that $\mathbf{u} - \mathbf{v}$ is the vertex of a parallelogram whose other vertices are $\mathbf{u}$, $\mathbf{0}$, and $-\mathbf{v}$.

3. $\mathbf{u}$ and $\mathbf{v}$ as in Exercise 1 4. $\mathbf{u}$ and $\mathbf{v}$ as in Exercise 2

U= [-1] ; V= [-3]

2 -1

- U = (-1,2)
- V= (-3,-1)
- -V = -[-3] = [3]
  -1 1
- -2V = -2[-3] = [6]
  -1 2
- U+V = [-1] + [-3] = [(-1)+(-3)= -4] = [-4]
  2 -1 (2)+(-1) = 1 1
- U-V = [-1] - [-3] = [(-1)-(-3)= 2] = [2]
  2 -1 (2)- (-1)=3 3
- U-2V = [-1]-(2)[-3] = [-1] – [(-2)(-3)= 6] = [-1] – [6] = [5]
  2 -1 2 (-2)(-1)= 2 2 2 0



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In Exercises 1 and 2, compute each matrix sum or product if it is defined. If an expression is undefined, explain why. Let

$$A = \begin{bmatrix} 2 & 0 & -1 \\ 4 & -5 & 2 \end{bmatrix}, \quad B = \begin{bmatrix} 7 & -5 & 1 \\ 1 & -4 & -3 \end{bmatrix},$$

$$C = \begin{bmatrix} 1 & 2 \\ -2 & 1 \end{bmatrix}, \quad D = \begin{bmatrix} 3 & 5 \\ -1 & 4 \end{bmatrix}, \quad E = \begin{bmatrix} -5 \\ 3 \end{bmatrix}$$

1. $-2A$, $B - 2A$, AC, CD

- -2A = [(-2)(2) = -4;(0)(-2)=0;(-2)(-1)=2] ===== [-4 0 2]
  (-2)(4) = -8;(-2)(-5)=10;(-2)(2)=-4 -8 10 -4
- B-2A = [7 -5 1] – [-4 0 2] = [3 -5 3] ****NOTE -2A came from above
  1 -4 -3 -8 10 -4 -7 6 -7
- AC = Size difference A=(2*3); C=(2*2) = UNDEFINED
- CD = [1 2]* [3 5] = [(1)(3)+(2)(-1) = 1; (1)(5)+(2)(4)=13
  -2 1 -1 4 (-2)(3)+(1)(-1)= -7; (-2)(5)+(1)(4)= -6

CD = [1 13]
-7 -6