

# CECS 229: HW 6 (Vector Operations and Graphical Representations)

Spring 2021

Remember, we will not be collecting or grading homework. The homework is optional but highly recommended. Quiz questions will be similar to the homework questions but not identical. Solutions to these problems are posted on BeachBoard.

1. Simplify into one vector:

a.  $3[3,2] - 2[5,2] = [-1, 2]$

b.  $\frac{1}{2}[-4,8,10] + [-3,5,-7] - \frac{1}{4}[16,-8,4] = [-9, 11, -3]$

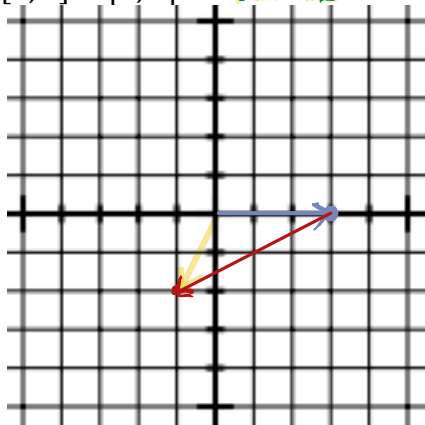
2. Find the dot product:

a.  $[3,4] \cdot [-5,2] = -7$

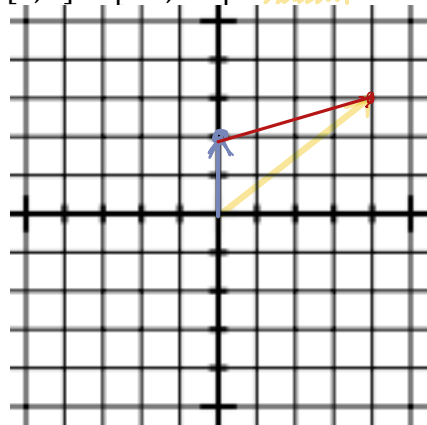
b.  $[-1,-3,-5,7] \cdot [2,4,6,8] = 12$

3. Compute the following linear combinations algebraically. Confirm your answer through a graph. *Solutions using head tail. parallelogram is okay.*

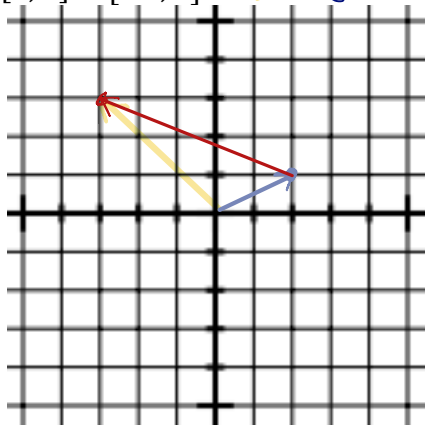
a.  $[3,0] - [4,2] = [-1,-2]$



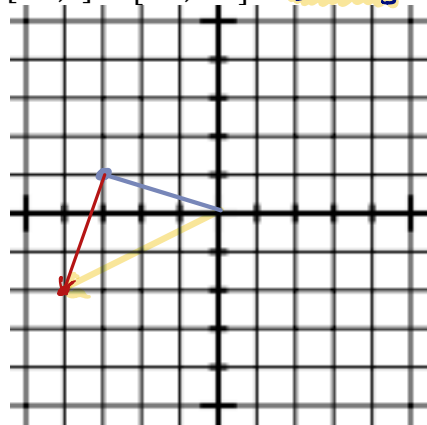
b.  $[0,2] - [-4,-1] = [4,3]$



c.  $[2,1] + [-5,2] = [-3,3]$



d.  $[-3,1] + [-1,-3] = [-4,-2]$



4. Find the lengths of:

a.  $w = \begin{bmatrix} 3 \\ -4 \end{bmatrix}$   $\|w\| = 5$

b.  $v = \begin{bmatrix} -5 & -12 \end{bmatrix}$   $\|v\| = 13$

c.  $x = \begin{bmatrix} -1 \\ -2 \\ 2 \end{bmatrix}$   $\|x\| = \sqrt{(-1)^2 + (-2)^2 + 2^2} = 3$

d.  $y = \begin{bmatrix} -5 & 4 & -2 & 2 \end{bmatrix}$   $\|y\| = \sqrt{(-5)^2 + 4^2 + (-2)^2 + 2^2} = 7$