

Homework 4 - Math 2568 (Autumn 2022)

Prof. Cueto

Due date: Friday September 23, 2022 (on Carmen).

The sections and problem numbers refer to the course's textbook (L.W. Johnson, R.D. Riess, J.T. Arnold: *Introduction to Linear Algebra*, 5th edition, Pearson.)

Section	Assigned Problems	Problems to be turned in
§2.1	1, 5, 6, 10, 15, 19, 26, 28, 30, 35	5, 6, 19, 26, 35
§2.2	1, 5, 8, 12, 22, 25, 28, 30, 33	5, 12, 22, 28, 33
§2.3	1, 4, 8, 13, 16, 19, 23, 32, 34, 42, 48	4, 8, 16, 23, 48

Section 2.1

5) $A = (-3, 5)$ $B = (2, 2)$
 $C = (3, 4)$ $D = (-2, 7)$

a) $u = \overrightarrow{AB}$ $x \rightarrow 2 - (-3) = 5$ $y \rightarrow 2 - 5 = -3$ $5 + (-3) = 2$

$v = \overrightarrow{CD}$ $x \rightarrow -2 - 3 = -5$ $y \rightarrow 7 - 4 = 3$ $(-5) + 3 = -2$
 $(2 = 2 \checkmark)$

b) $u = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$
 $v = \begin{pmatrix} -5 \\ 3 \end{pmatrix}$

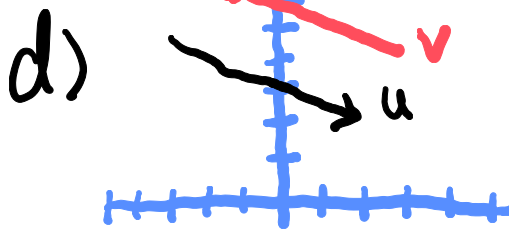
c) $b_1 - a_1 = 2 - (-3) = 5$

$b_2 - a_2 = 2 - 5 = -3$

$\begin{matrix} 5 \neq -5 \\ -3 \neq 3 \end{matrix}$

$d_1 - c_1 = -2 - 3 = -5$

$d_2 - c_2 = 7 - 4 = 3$

d)  Different directions

6) $A = (-1, -3)$ $B = (3, 2)$ $C = (0, 2)$

$$AB = (3 - (-1), 2 - (-3)) = (4, 5)$$

$$D = (4, 7)$$

$$D = C + AB = (4, 5) + (0, 2) = (4, 7)$$

19) $u = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$ $v = \begin{bmatrix} 2 \\ -2 \end{bmatrix}$ $A = (2, -1)$

$$B = u + A = (1+2, 3+(-1)) = (3, 2)$$

$$B = (3, 2)$$

$$C = (5, 0)$$

$$C = (u+v) + A = \begin{bmatrix} 3 \\ 1 \end{bmatrix} + A = (3+2, 1-1) = (5, 0)$$

