$$a = \begin{bmatrix} 2 \\ 2 \end{bmatrix} \quad , \quad b = \begin{bmatrix} 1 \\ -2 \end{bmatrix} \quad , \quad c = \begin{bmatrix} -1 \\ 0 \end{bmatrix}$$

$$\left. \begin{array}{l} 2 = q_1 - q_2 \\ 2 = -2q_1 + 0 \end{array} \right\} \quad \begin{array}{l} -1 = q_1 \\ q_2 = -1 - 2 \\ = -3 \end{array}$$
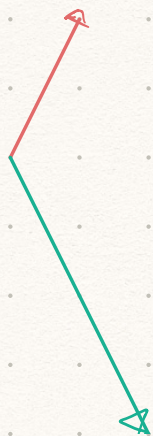

ExAM — Week 2.

Juan Sebastián Vargas C.

$$V = \begin{bmatrix} 1 \\ 2 \end{bmatrix} \qquad C = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

1.)

$$\text{Proy}_C V = \frac{V \cdot C}{|C|^2} \cdot C$$

$$= \frac{1 \cdot 1 + 2 \cdot 1}{(\sqrt{2})^2} = \frac{3}{2} = \frac{3}{2}$$

$$\Rightarrow \frac{3}{2} C = \frac{3}{2} \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

2.)

$$V = \begin{bmatrix} 2 \\ 1 \end{bmatrix} \qquad \text{Proy}_W V = \frac{V \cdot W}{|W|^2}$$

$$W = \begin{bmatrix} 3 \\ -4 \end{bmatrix}$$

$$\Rightarrow \frac{2 \cdot 3 + 1 \cdot -4}{(\sqrt{9 + 16})^2} = \frac{6 - 4}{} = \frac{2}{25}$$

3.) $V = \begin{bmatrix} -4 \\ -3 \\ 8 \end{bmatrix}$ $\qquad b_2 = \begin{bmatrix} -2 \\ 1 \\ 0 \end{bmatrix}$

$b_1 = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ $\qquad b_3 = \begin{bmatrix} -3 \\ -6 \\ 5 \end{bmatrix}$

1.) $\text{Proy}_{b_1} V = \dfrac{V \cdot b_1}{|b_1|^2}$

$= \dfrac{-4 \cdot 1 + -3 \cdot 2 + 8 \cdot 3}{|1 + 4 + 9|}$ $\qquad \dfrac{14}{14}$

$= \dfrac{-4 - 6 + 24}{14} = 1$

2.) $\text{Proy}_{b_2} V = \dfrac{V \cdot b_2}{|b_2|^2} =$

$$= \frac{-4 \cdot -2 + -3 \cdot 1 + 0}{(4+1)} = \frac{+8 - 3}{5} = 1$$

3.) $\text{Proy}_{b_3} V = \frac{V \cdot b_3}{|b_3|^2} =$

$$= \frac{-4 \cdot -3 + -3 \cdot -6 + 8 \cdot 5}{(9 + 36 + 25)}$$

$$= \frac{+12 + 18 + 40}{70} = \frac{70}{70} = 1$$

$$x + 3y = z$$
$$2x - 4y = -8z$$
$$-x + 5y = 7z$$

$8y = 8z$ $\bigg|$ $2x = -4y$
             $x = \frac{-4}{2}y$

$y = z$

$P = \begin{bmatrix} 3 \\ 2 \\ 4 \end{bmatrix}$ $V = \begin{bmatrix} -1 \\ 2 \\ -3 \end{bmatrix}$

$$x_f = P + Ut$$

$$x_f = \begin{bmatrix} 3 \\ 2 \\ 4 \end{bmatrix} + 2 \begin{bmatrix} -1 \\ 2 \\ -3 \end{bmatrix}$$

$$t = 2$$

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