00283319 – Mier Montoto, Juan Francisco 29/10/20

1. Para $\vec{v_1}=(4,2,-2)$, $16+16-2(16)=0$ ✓ $\Rightarrow v_1 \in U$

Para $\vec{v_2}=(-6,1,1)$, $-24+8+16=0$ ✓ $\Rightarrow v_2 \in U$

$$\begin{matrix}(4,2,-2)\\(6,1,1)\end{matrix} \rightarrow \begin{matrix}(4,2,-2)\\(0,4,-2)\end{matrix}$$ → No hay fila nula → Sistema libre

$$\left(\begin{array}{cc|c} 4 & 6 & x \\ 2 & 1 & y \\ -2 & 1 & z \end{array}\right) \xrightarrow[x=-2y-4z]{\substack{F_3'=F_3+F_1'\\ F_1'=F_1/2\\ F_2'=F_2-F_1'}} \left(\begin{array}{cc|c} 2 & -3 & -y-2z \\ 0 & 4 & 2y+2z \\ 0 & -2 & -y-z \end{array}\right) \xrightarrow{\substack{F_2'=F_2/2\\ F_3'=F_3+F_2'}} \left(\begin{array}{cc|c} 2 & -3 & -y-2z \\ 0 & 2 & y+z \\ 0 & 0 & 0 \end{array}\right)$$

Sistema generador

$2\alpha_1-3\alpha_2=6-4 \mid 2\alpha_2=-4$

$2\alpha_1-3\alpha_2=2 \quad \alpha_2=-2$

$2\alpha_1=2+3\alpha_2 \rightarrow \alpha_1=+2$

2. 1)
$$\left(\begin{array}{ccccc} -1 & 1 & -1 & -4 & -3 \\ 3 & -1 & -3 & -17 & 2 \\ 3 & -1 & -5 & -29 & 0 \\ 1 & 0 & 3 & -18 & -4 \end{array}\right) \xrightarrow[F_4'=F_4+F_1]{\substack{F_2'=F_2+3F_1\\ F_3'=F_3+3F_1}} \left(\begin{array}{ccccc} -1 & 1 & -1 & -4 & -3 \\ 0 & 2 & -6 & -29 & -7 \\ 0 & 2 & -4 & -41 & -9 \\ 0 & 1 & 2 & -22 & -7 \end{array}\right) \xrightarrow[F_2'=F_4]{F_4'=F_2}$$

$$\rightarrow \left(\begin{array}{ccccc} -1 & 1 & -1 & -4 & -3 \\ 0 & 1 & 2 & -22 & -7 \\ 0 & 2 & -4 & -41 & -9 \\ 0 & 2 & -6 & -29 & -7 \end{array}\right) \xrightarrow[F_4'=F_4-2F_2]{F_3'=F_3-2F_2} \left(\begin{array}{ccccc} -1 & 1 & -1 & -4 & -3 \\ 0 & 1 & 2 & -22 & -7 \\ 0 & 0 & -12 & 3 & 5 \\ 0 & 0 & -10 & 15 & 7 \end{array}\right) \xrightarrow{F_4'=F_4-F_3\cdot\frac{5}{6}}$$

Clase 2

$$\rightarrow \left(\begin{array}{ccccc} -1 & 1 & -1 & -4 & -3 \\ 0 & 1 & 2 & -22 & -7 \\ 0 & 0 & -12 & 3 & 5 \\ 0 & 0 & 0 & 9/2 & 17/6 \end{array}\right)$$ → como la última fila no es nula, se trata de un sistema libre.

$$\left(\begin{array}{cccc|c} -1 & 3 & 3 & 1 & -6 \\ 1 & -1 & -1 & 0 & 1 \\ -1 & -3 & -5 & 3 & 6 \\ -1 & -17 & -29 & -18 & 68 \\ -3 & 2 & 0 & -4 & 5 \end{array}\right) \xrightarrow[\substack{F_3'=F_3-F_1\\ F_4'=F_4-4F_1\\ F_5'=F_5-3F_1}]{F_2'=F_2+F_1} \left(\begin{array}{cccc|c} -1 & 3 & 3 & 1 & -6 \\ 0 & 2 & 2 & 1 & -5 \\ 0 & -6 & -8 & 2 & 12 \\ 0 & -29 & -41 & -22 & 92 \\ 0 & -7 & -9 & -7 & 23 \end{array}\right) \xrightarrow[\substack{F_3'=F_3+3F_2'\\ F_4'=F_4+7F_2'\\ F_5'=F_5+7F_2'}]{F_2'=F_2/2} \left(\begin{array}{cccc|c} -1 & 3 & 3 & 1 & -6 \\ 0 & 1 & 1 & 1/2 & -5/2 \\ 0 & 0 & -2 & 5 & -3 \\ 0 & 0 & 12 & -7/2 & 19/2 \\ 0 & 0 & -2 & -3/2 & 9/2 \end{array}\right)$$