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1.1)
$$\begin{pmatrix} 6 & 0 & 0 & 6 & 6 \\ -2 & 2 & 2 & -2 & -2 \\ 4 & -1 & -1 & 4 & 4 \end{pmatrix} \xrightarrow[F_2'=F_2'+F_1,\ F_1'=F_1/6,\ F_2'=F_1/2,\ F_3'=F_3-4F_1]{} \begin{pmatrix} \textcircled{1} & 0 & 0 & 1 & 1 \\ 0 & \textcircled{1} & 1 & 0 & 0 \\ 0 & -1 & -1 & 0 & 0 \end{pmatrix} \rightarrow Rg = 2$$

2) Para que sean equivalentes, $\langle S \rangle = \langle S' \rangle$

$$\begin{pmatrix} 1 & 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 \\ 8 & -2 & -2 & 8 & 8 \\ 8 & -2 & -2 & 8 & 8 \end{pmatrix} \xrightarrow[F_4'=F_4-F_3,\ F_3'=F_3/2,\ F_8'=F_3'-4F_1]{} \begin{pmatrix} \textcircled{1} & 0 & 0 & 1 & 1 \\ 0 & \textcircled{1} & 1 & 0 & 0 \\ 0 & -1 & -1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 \end{pmatrix} \rightarrow \text{Son equivalentes.}$$

2.
$$\begin{pmatrix} 5 & 1 & -3 & 0 & 0 & 0 \\ 0 & 1 & 0 & 3 & 1 & 0 \\ 1 & -5 & 0 & 5 & 0 & -1 \\ 15 & 2 & -3 & -3 & -1 & 0 \end{pmatrix} \xrightarrow[F_3'=F_1]{F_1'=F_3} \begin{pmatrix} 1 & -5 & 0 & 5 & 0 & -1 \\ 0 & 1 & 0 & 3 & 1 & 0 \\ 5 & 1 & -3 & 0 & 0 & 0 \\ 15 & 2 & -3 & -3 & -1 & 0 \end{pmatrix} \xrightarrow[F_4'=F_4-15F_1]{F_3'=F_3-5F_1}$$

$$\rightarrow \begin{pmatrix} 1 & -5 & 0 & 5 & 0 & -1 \\ 0 & 1 & 0 & 3 & 1 & 0 \\ 0 & 26 & -3 & -25 & 0 & 5 \\ 0 & 77 & -3 & -78 & -1 & 15 \end{pmatrix} \xrightarrow[F_4'=F_4-77F_2]{F_3'=F_3-26F_2} \begin{pmatrix} 1 & -5 & 0 & 5 & 0 & -1 \\ 0 & 1 & 0 & 3 & 1 & 0 \\ 0 & 0 & -3 & 103 & -26 & 5 \\ 0 & 0 & -3 & 309 & -78 & 15 \end{pmatrix} \xrightarrow{F_4'=F_4-F_3}$$

$$\rightarrow \begin{pmatrix} 1 & -5 & 0 & 5 & 0 & -1 \\ 0 & 1 & 0 & 3 & 1 & 0 \\ 0 & 0 & -3 & 103 & -26 & 5 \\ 0 & 0 & 0 & 206 & -52 & 10 \end{pmatrix} \xrightarrow{F_4'=F_4/2} \begin{pmatrix} 1 & -5 & 0 & 5 & 0 & -1 \\ 0 & 1 & 0 & 3 & 1 & 0 \\ 0 & 0 & -3 & 103 & -26 & 5 \\ 0 & 0 & 0 & 103 & -26 & 5 \end{pmatrix} \rightarrow \text{NO implícitas}$$

$$(x_1, x_2, x_3) = \alpha_1(1,-5,0,5,0,-1) + \alpha_2(0,1,0,3,1,0) + \alpha_3(0,0,-3,103,-26,5) =$$

$$= (\alpha_1, \alpha_2 - 5\alpha_1, -3\alpha_3, 5\alpha_1 + 3\alpha_2 + 103\alpha_3, \alpha_2 - 26\alpha_3, -\alpha_1 + 5\alpha_3)$$

$\dim \mathbb{R}^6 = n^o \text{ec. generadoras} = 6$

$\dim \langle S \rangle = n^o \text{vectores} = 3$

$n^o \text{imp.} \rightarrow 3$

$$\left.\begin{array}{l} x_1 = \alpha_1 \\ x_2 = \alpha_2 - 5\alpha_1 \\ x_3 = -3\alpha_3 \\ x_4 = 5\alpha_1 + 3\alpha_2 + 103\alpha_3 \\ x_5 = \alpha_2 - 26\alpha_3 \\ x_6 = 5\alpha_3 - \alpha_1 \end{array}\right\} \begin{array}{l} \alpha_2 = x_2 + 5x_1 \\ \alpha_1 = x_1 \\ \alpha_3 = x_3/(-3) \end{array}$$

3 ec. implícitas:
$$\begin{cases} x_4 + 3x_2 - 20x_1 + \frac{103}{3}x_3 = 0 \\ x_5 - x_2 - 5x_1 + \frac{26}{3}x_3 = 0 \\ x_6 + x_1 + \frac{5}{3}x_3 = 0 \end{cases}$$