Punto 5.

$a_{11}X_1 + a_{12}X_2 + \dots + a_{1n}X_n = b_1$

$a_{21}X_1 + a_{22}X_2 + \dots + a_{2n}X_n = b_2$

$\vdots$

$a_{n1}X_1 + a_{n2}X_2 + \dots + a_{nn}X_n = b_n$

Se representa como:

$$\begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{12} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & & \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_n \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ \vdots \\ b_n \end{bmatrix}$$

- Sustitución Regresiva:

$$\begin{aligned} a_{11}X_1 + a_{12}X_2 + \dots + a_{1n-1}X_{n-1} + a_{1n}X_n &= b_1 \\ a_{22}X_2 + \dots + a_{2n-2}X_{n-1} + a_{2n}X_n &= b_2 \\ &\vdots \\ a_{n-1n-1}X_{n-1} + a_{n-1n}X_n &= b_{n-1} \\ a_{nn}X_n &= b_n \end{aligned}$$

Al resolver la ecuación n-esima de X_n:

$$X_n = \frac{b_n}{a_{nn}} \quad (1)$$

Al resolver la ecuación $(n-1)$-esima de X_{n-1} usando (1):

$$X_{n-1} = \frac{b_{n-1} - a_{n-1n}X_n}{a_{n-1n-1}}$$

Para luego dar con que

$$x_i = \frac{b_i - a_{in}x_n - a_{in-1}x_{n-1} - \dots - a_{ii+1}x_{i+1}}{a_{ii}}$$

Por lo tanto

$$x_i = \frac{b_i - \sum_{j=i+1}^{n} a_{ij}x_j}{a_{ii}}$$

Q//.