

$$\textcircled{3} \quad \begin{cases} x+y+z=225 \\ 50x+20y+10z=7000 \\ x+z=24 \end{cases} \quad \left( \begin{array}{ccc|c} 1 & 1 & 1 & 225 \\ 50 & 20 & 10 & 7000 \\ 1 & 0 & 1 & 24 \end{array} \right)$$

SCD

$$|A| = (20-100+10) - (20-20+50) = -70-50 = -120$$

$$x = \frac{\begin{vmatrix} 225 & 1 & 1 \\ 7000 & 20 & 10 \\ 0 & -2 & 1 \end{vmatrix}}{-120} = \frac{-12000}{-120} = 100$$

$$y = \frac{\begin{vmatrix} 1 & 225 & 1 \\ 50 & 7000 & 10 \\ 1 & 0 & 1 \end{vmatrix}}{-120} = \frac{-9000}{-120} = 75$$

$$z = \frac{\begin{vmatrix} 1 & 1 & 225 \\ 50 & 20 & 7000 \\ 1 & -2 & 0 \end{vmatrix}}{-120} = \frac{-6000}{-120} = +50$$

$$\textcircled{4} \quad \left( \begin{array}{ccc|c} 1 & -1 & 1 & 4 \\ m & 1 & -3 & 8 \\ 1 & m & 7 & 8 \end{array} \right) \quad |A| = (7+m^2+3) - (1-3m-7m) = m^2+10-1+10m = m^2+10m+9 = 0 \rightarrow m = \frac{-10 \pm \sqrt{100-36}}{2} = \frac{-10 \pm 8}{2} = \begin{cases} -9 \\ -1 \end{cases}$$

a) Si  $m \neq -1, -9$   $\Rightarrow A = 3 = \text{rg } A^* = \text{rango} \Rightarrow \text{SCD}$

b) Si  $m = -9$   $\left( \begin{array}{ccc|c} 1 & -1 & 1 & 4 \\ -9 & 1 & -3 & 8 \\ 1 & -9 & 7 & 8 \end{array} \right) \quad \text{rg } A = 2$   $\left( \begin{array}{ccc|c} 1 & -1 & 1 & 4 \\ -9 & 1 & -3 & 8 \\ 0 & -8 & 6 & 4 \end{array} \right)$

$$|A^*| = \begin{vmatrix} 1 & -1 & 4 \\ -9 & 1 & 8 \\ 1 & -9 & 8 \end{vmatrix} = 320 \Rightarrow \text{rg } A^* = 3$$

$\text{rg } A = 2 \neq \text{rg } A^* = 3 \Rightarrow \text{SI}$   
No tiene solución

c)  $m = 1 \rightarrow \text{SCD} \quad |A| = 1+10+9=20$

$$x = \frac{\begin{vmatrix} 4 & -1 & 1 \\ 8 & 1 & -3 \\ 8 & 1 & 7 \end{vmatrix}}{20} = \frac{120}{20} = 6 \quad ; \quad y = \frac{\begin{vmatrix} 1 & 4 & 1 \\ 1 & 8 & -3 \\ 1 & 8 & 7 \end{vmatrix}}{20} = \frac{40}{20} = 2 \quad ; \quad z = \frac{\begin{vmatrix} 1 & -1 & 4 \\ 1 & 1 & 8 \\ 1 & 1 & 8 \end{vmatrix}}{20} = 0$$

(6, 2, 0)