SISTEMAS CON PARÁMETROS

DISCUTE EN FUNCIÓN DEL PARÁMETRO Y RESUELVE (CUANDO SEA POSIBLE) LOS SIGUIENTES SISTEMAS DE ECUACIONES LINEALES

1. $\begin{cases} 4x+2y=a \\ x+y-z=2 \\ ax+y+z=1 \end{cases}$

2. $\begin{cases} 2x-y+3z=2 \\ 5x-y+az=6 \\ x+y+2z=2 \end{cases}$

3. $\begin{cases} x+2y-z=4 \\ 3x-y+z=9 \\ 4x+y+az=13 \end{cases}$

4. $\begin{cases} x-3y+2z=0 \\ 2x-y+z=0 \\ -3x+ay-3z=0 \end{cases}$

5. $\begin{cases} x+y=1 \\ ax+3y-2z=0 \\ -x-4z=3 \end{cases}$

6. $\begin{cases} mx+2z=6 \\ 3x+y=0 \\ 2x+mz=6 \end{cases}$

7. $\begin{cases} x+my+z=1 \\ x+y-z=m+1 \\ mx+y+(m-1)z=m \end{cases}$

8. $\begin{cases} x+y+mz=m \\ mx+my+z=1 \\ x+my+z=m \end{cases}$

9. $\begin{cases} x+y+z=m \\ x+y+(m+1)z=0 \\ x+(m+1)y+z=2 \end{cases}$

10. $\begin{cases} 2x+y+mz=4 \\ x+z=2 \\ x+y+z=2 \\ t=5 \end{cases}$

11. $\begin{cases} mx+z+t=1 \\ my+z-t=1 \\ my+2z-2t=2 \\ mz-t=0 \end{cases}$

12. $\begin{cases} x+y+mz=0 \\ 3x+2y+4mz=0 \\ 2x+y+3z=0 \end{cases}$

13. $\begin{cases} ax+2y=2 \\ 2x+ay=a \\ x-y=-1 \end{cases}$

14. $\begin{cases} 2x-4y-az=-2 \\ y-z=0 \\ ax+2z=2 \end{cases}$

15. $\begin{cases} ax+y+z=0 \\ x+ay+z=0 \\ x+y+az=0 \end{cases}$

16. $\begin{cases} ax+y+z=3 \\ x+ay+z=3 \\ x+y+az=3 \end{cases}$

17. $\begin{cases} x+y+z=1 \\ (a+1)x+y+az=a \\ x+(a+1)y+z=1 \end{cases}$

18. $\begin{cases} ax+y+z=0 \\ x+ay+z=0 \\ x+y+az=0 \end{cases}$

SOLUCIONES

1. $\begin{cases} \text{Si } a\neq 3 \Rightarrow S.C.D. & \left(-1, \frac{a+4}{2}, \frac{a-2}{2}\right) \\ \text{Si } a=3 \Rightarrow S.C.I. & \left(\lambda, \frac{3-4\lambda}{2}, \frac{-2\lambda-1}{2}\right)\ \lambda\in\Re \end{cases}$

2. $\begin{cases} \text{Si } a\neq 8 \Rightarrow S.C.D. & \left(\frac{4}{3}, \frac{2}{3}, 0\right) \\ \text{Si } a=8 \Rightarrow S.C.I. & \left(\frac{4-5\lambda}{3}, \frac{2-\lambda}{3}, \lambda\right)\ \lambda\in\Re \end{cases}$

3. $\begin{cases} \text{Si } a\neq 0 \Rightarrow S.C.D. & \left(\frac{22}{7}, \frac{3}{7}, 0\right) \\ \text{Si } a=0 \Rightarrow S.C.I. & (\lambda, 13-4\lambda, 22-7\lambda)\ \lambda\in\Re \end{cases}$

4. $\begin{cases} \text{Si } a\neq 4 \Rightarrow S.C.D. & (0,0,0) \\ \text{Si } a=4 \Rightarrow S.C.I. & \left(\frac{-\lambda}{5}, \frac{3\lambda}{5}, \lambda\right)\ \lambda\in\Re \end{cases}$

5. $\begin{cases} \text{Si } a\neq \frac{5}{2} \Rightarrow S.C.D. & \left(\frac{9}{5-2a}, \frac{-4-2a}{5-2a}, \frac{3a-12}{10-4a}\right) \\ \text{Si } a=\frac{5}{2} \Rightarrow S.I. & \end{cases}$

6. $\begin{cases} \text{Si } m\neq 2 \text{ y } m\neq -2 \Rightarrow S.C.D. & \left(\frac{6}{m+2}, \frac{-18}{m+2}, \frac{6}{m+2}\right) \\ \text{Si } m=2 \Rightarrow S.C.I. & (3-\lambda, 3\lambda-9, \lambda)\ \lambda\in\Re \\ \text{Si } m=-2 \Rightarrow S.I. & \end{cases}$ 7.

7. $\begin{cases} \text{Si } m\neq 1 \Rightarrow S.C.D. & \left(\frac{-m^3+m^2+2m-1}{m-1}, \frac{-m}{m-1}, m^2+m\right) \\ \text{Si } m=1 \Rightarrow S.I. & \end{cases}$

8. $\begin{cases} \text{Si } m\neq 1 \text{ y } m\neq -1 \Rightarrow S.C.D. & (-1,1,1) \\ \text{Si } m=1 \Rightarrow S.C.I. & (1-\lambda-\alpha, \lambda, \alpha)\ \lambda,\alpha\in\Re \\ \text{Si } m=-1 \Rightarrow S.C.I. & (-1,\lambda,\lambda)\ \lambda\in\Re \end{cases}$

9. $\begin{cases} \text{Si } m\neq 0 \Rightarrow S.C.D. & \left(\frac{m^2+2m-2}{m}, \frac{2-m}{m}, -1\right) \\ \text{Si } m=0 \Rightarrow S.I. & \end{cases}$

10. $\begin{cases} \text{Si } m\neq 2 \Rightarrow S.C.D. & (2,0,0,5) \\ \text{Si } m=2 \Rightarrow S.C.I. & (2-\lambda, 0, \lambda, 5)\ \lambda\in\Re \end{cases}$

11. $\begin{cases} \text{Si } m\neq 0 \text{ y } m\neq 1 \Rightarrow S.C.D. & \left(\frac{2}{m-1}, 0, \frac{-1}{m-1}, \frac{-m}{m-1}\right) \\ \text{Si } m=0 \Rightarrow S.C.I. & (\lambda, \alpha, 1, 0)\ \lambda,\alpha\in\Re \\ \text{Si } m=1 \Rightarrow S.I. & \end{cases}$

12. $\begin{cases} \text{Si } m\neq 1 \Rightarrow S.C.D. & (0,0,0) \\ \text{Si } m=1 \Rightarrow S.C.I. & (-2\lambda, \lambda, \lambda)\ \lambda\in\Re \end{cases}$

13. $\begin{cases} \text{Si } a\neq -2 \Rightarrow S.C.D. & (0,1) \\ \text{Si } a=-2 \Rightarrow S.C.I. & (-1+\lambda, \lambda)\ \lambda\in\Re \end{cases}$

14. $\begin{cases} \text{Si } a \neq -2 \Rightarrow S.C.D. & \left(\frac{2}{a+2}, \frac{2}{a+2}, \frac{2}{a+2}\right) \\ \text{Si } a = -2 \Rightarrow S.C.I. & (\lambda - 1, \lambda, \lambda) \;\; \lambda \in \Re \end{cases}$

15. $\begin{cases} \text{Si } a \neq 1 \text{ y } a \neq -2 \Rightarrow S.C.D. & (0,0,0) \\ \text{Si } a = 1 \Rightarrow S.C.I. & (-\lambda - \alpha,\ \alpha,\ \lambda) \;\; \lambda, \alpha \in \Re \\ \text{Si } a = -2 \Rightarrow S.C.I & (\lambda, \lambda, \lambda) \;\; \lambda \in \Re \end{cases}$

16. $\begin{cases} \text{Si } a \neq 1 \text{ y } a \neq -2 \Rightarrow S.C.D. & \left(\frac{3}{a+2}, \frac{3}{a+2}, \frac{3}{a+2}\right) \\ \text{Si } a = 1 \Rightarrow S.C.I. & (3 - \lambda - \alpha,\ \alpha,\ \lambda) \;\; \lambda, \alpha \in \Re \\ \text{Si } a = -2 \Rightarrow S.I & \end{cases}$

17. $\begin{cases} \text{Si } a \neq 0 \Rightarrow S.C.D. & \left(-\frac{a+1}{a}, 0, \frac{1}{a}\right) \\ \text{Si } a = 0 \Rightarrow S.I. & \end{cases}$

18. El sistema es incompatible ($S.I.$) para cualquier valor de a