Ejercicios de Sistemas de ecuaciones no lineales

1) Hallar la solución de los siguientes sistemas de ecuaciones no lineales:

a) $\left.\begin{array}{r} x + 2y = -4 \\ 5x^2 - 5y = 25 \end{array}\right\}$

b) $\left.\begin{array}{r} x^2 + y^2 - 9x = 86 \\ x + 3y = 37 \end{array}\right\}$

c) $\left.\begin{array}{r} x + 2y = -8 \\ 8x^2 + 4y^2 - 8x = 84 \end{array}\right\}$

d) $\left.\begin{array}{r} x - 2y = -14 \\ 5x^2 - 5y = -10 \end{array}\right\}$

e) $\left.\begin{array}{r} 8x^2 + 2y = 0 \\ 3x - y = 0 \end{array}\right\}$

f) $\left.\begin{array}{r} x + 2y = 5 \\ 3x^2 - 2y = 19 \end{array}\right\}$

2) Resolver los siguientes sistemas de ecuaciones no lineales:

a) $\left.\begin{array}{l} y = \sqrt{x + 66} - 12 \\ 3x + 2y = -14 \end{array}\right\}$

b) $\left.\begin{array}{l} \sqrt{3x + 24 + y} - x = 9 \\ 3x + 9 = -3y \end{array}\right\}$

c) $\left.\begin{array}{l} \sqrt{x + 12} = y + 5 \\ x - y = 5 \end{array}\right\}$

d) $\left.\begin{array}{l} -7y - 15 = -2x \\ x = \sqrt{2x + 42 + y} - 3 \end{array}\right\}$

e) $\left.\begin{array}{l} 2x + 7 = -3y \\ y = \sqrt{x + 14} - 2 \end{array}\right\}$

f) $\left.\begin{array}{l} 3x + 17 = 2y \\ x = \sqrt{2x + 51 + y} - 10 \end{array}\right\}$

3) Resolver los siguientes sistemas de ecuaciones no lineales:

a) $\left.\begin{array}{l} 2^x + 2^y = 24 \\ 2^{x-y} = 2 \end{array}\right\}$

b) $\left.\begin{array}{l} 3^x - 3^y = 72 \\ x - y = 2 \end{array}\right\}$

c) $\left.\begin{array}{l} 3^{x+1} - 3^{y+2} = 0 \\ 3^x - 3^{y-1} = 72 \end{array}\right\}$

d) $\left.\begin{array}{l} 4^{6x+3y} = 1 \\ 4^{7x+6y} = 1 \end{array}\right\}$

e) $\left.\begin{array}{l} 4^x + 4^y = 20 \\ 4^{x-y} = 4 \end{array}\right\}$

f) $\left.\begin{array}{l} x - y = 2 \\ 6^x - 6^y = 210 \end{array}\right\}$

4) Resolver:

a) $\left.\begin{array}{l} \log_3 x + \log_3 y = 8 \\ x - 3y = 162 \end{array}\right\}$

b) $\left.\begin{array}{l} \log_3(x + y + 405) = 6 \\ \log_3 x - \log_3 y = 1 \end{array}\right\}$

c) $\left.\begin{array}{l} \log_4 x + \log_4 y = 3 \\ \log_4 x - 2\log_4 y = 3 \end{array}\right\}$

d) $\left.\begin{array}{l} \log_5 x + \log_5 y = 3 \\ 4x - 3y = 85 \end{array}\right\}$

e) $\left.\begin{array}{l} x - y = -56 \\ \log_2 x + \log_2 y = 9 \end{array}\right\}$

f) $\left.\begin{array}{l} \log x + 2\log y = 6 \\ \log x + 3\log y = 9 \end{array}\right\}$

Ejercicios de Sistemas de ecuaciones no lineales

Soluciones:

1)

a) $x_1 = \frac{3}{2}$, $y_1 = \frac{-11}{4}$, $x_2 = -2$, $y_2 = -1$

b) $x_1 = \frac{17}{2}$, $y_1 = \frac{19}{2}$, $x_2 = 7$, $y_2 = 10$

c) $x_1 = \frac{10}{9}$, $y_1 = \frac{-41}{9}$, $x_2 = -2$, $y_2 = -3$

d) $x_1 = \frac{5}{2}$, $y_1 = \frac{33}{4}$, $x_2 = -2$, $y_2 = 6$

e) $x_1 = 0$, $y_1 = 0$, $x_2 = \frac{-3}{4}$, $y_2 = \frac{-9}{4}$

f) $x_1 = \frac{8}{3}$, $y_1 = \frac{7}{6}$, $x_2 = -3$, $y_2 = 4$

2)

a) $x = -2$, $y = -4$ **b)** $x = -6$, $y = 3$ **c)** $x = 4$, $y = -1$

d) $x = 4$, $y = -1$ **e)** $x = -5$, $y = 1$ **f)** $x = -3$, $y = 4$

3)

a) $x = 4$, $y = 3$ **b)** $x = 4$, $y = 2$ **c)** $x = 4$, $y = 3$

d) $x = 0$, $y = 0$ **e)** $x = 2$, $y = 1$ **f)** $x = 3$, $y = 1$

4)

a) $x = 243$, $y = 27$ **b)** $x = 243$, $y = 81$ **c)** $x = 64$, $y = 1$

d) $x = 25$, $y = 5$ **e)** $x = 8$, $y = 64$ **f)** $x = 1$, $y = 1000$