Resolución de sistemas

1. Resuelve los siguientes sistemas por el método de sustitución:

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

b) $\left.\begin{array}{l} 5x-y=12 \\ x+7y=24 \end{array}\right\}$

c) $\left.\begin{array}{l} -x-20y=10 \\ 2x+3y=23 \end{array}\right\}$

d) $\left.\begin{array}{l} 3x+3y=-21 \\ 2x+2y=-14 \end{array}\right\}$

2. Resuelve los siguientes sistemas por el método de reducción:

a) $\left.\begin{array}{l} 7x-4y=-58 \\ 4x+7y=4 \end{array}\right\}$

b) $\left.\begin{array}{l} x+5y=0 \\ 3x-y=0 \end{array}\right\}$

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

3. Resuelve los siguientes sistemas por el método que prefieras:

a) $\left.\begin{array}{l} x-7y=-3 \\ 7x+y=29 \end{array}\right\}$

b) $\left.\begin{array}{l} 2x+3y=0 \\ 4x-y=14 \end{array}\right\}$

Solucionario

1 ***a)*** $\left.\begin{array}{l} 2x+2y=0 \\ x-3y=-8 \end{array}\right\} \Leftrightarrow \left.\begin{array}{l} 2x+2y=0 \\ x=-8+3y \end{array}\right\}$

$2\cdot(-8+3y)+2y=0 \Rightarrow -16+6y+2y=0 \Rightarrow 8y=16 \Rightarrow y=2 \Rightarrow x=-8+3\cdot 2=-2$

$x=-2, y=2$

b) $\left.\begin{array}{l} 5x-y=12 \\ x+7y=24 \end{array}\right\} \Leftrightarrow \left.\begin{array}{l} 5x-y=12 \\ x=24-7y \end{array}\right\}$

$5\cdot(24-7y)-y=12 \Rightarrow 120-35y-y=12 \Rightarrow 108=36y \Rightarrow y=3 \Rightarrow x=24-7\cdot 3=3$

$x=3, y=3$

c) $\left.\begin{array}{l} -x+20y=10 \\ 2x+3y=23 \end{array}\right\} \Leftrightarrow \left.\begin{array}{l} x=20y+10 \\ 2x+3y=23 \end{array}\right\}$

$2\cdot(20y-10)+3y=23 \Rightarrow 40y-20+3y=23 \Rightarrow 43y=43 \Rightarrow y=1 \Rightarrow x=20\cdot 1-10=10$

$x=10, y=1$

d) $\left.\begin{array}{l} 3x+3y=-21 \\ 2x+2y=-14 \end{array}\right\} \Leftrightarrow \left.\begin{array}{l} 3x+3y=-21 \\ x=\dfrac{-14-2y}{2} \end{array}\right\}$

$x=\dfrac{-14-2y}{2}=-7-y \Rightarrow 3\cdot(-7-y)+3y=-21 \Rightarrow -21-3y+3y=-21 \Rightarrow 0=0$

Tiene infinitas soluciones

2 ***a)*** $\left.\begin{array}{l} 7x-4y=-58 \\ 4x+7y=4 \end{array}\right\} \Leftrightarrow \left.\begin{array}{r} 49x-28y=-406 \\ \underline{16x+28y=\quad 16} \\ 65x\qquad =-390 \end{array}\right\}$

$x=-6 \Leftrightarrow y=\dfrac{7\cdot(-6)+58}{4}=4$

$x=-6, y=4$

b) $\left.\begin{array}{l} x+5y=0 \\ 3x-y=0 \end{array}\right\} \Leftrightarrow \left.\begin{array}{r} x+5y=0 \\ \underline{15x-5y=0} \\ 16x\quad =0 \end{array}\right\}$

$x=0, y=0$

c) $\left.\begin{array}{l} -2x+y=3 \\ x-y=-3 \end{array}\right\} \Leftrightarrow \left.\begin{array}{r} -2x+y=\quad 3 \\ \underline{\quad x-y=-3} \\ -x\quad =\quad 0 \end{array}\right\}$

$x=0, y=3$

3 ***a)*** $\left.\begin{array}{l} x-7y=-3 \\ 7x+y=29 \end{array}\right\} \Leftrightarrow \left.\begin{array}{r} x-7y=\ -3 \\ \underline{49x+7y=203} \\ 50x\quad =200 \end{array}\right\}$

$x=4 \Leftrightarrow y=29-7\cdot 4=1$

$x=4, y=1$

b) $\left.\begin{array}{l} 2x+3y=0 \\ 4x-y=14 \end{array}\right\} \Leftrightarrow \left.\begin{array}{r} 2x+3y=\ 0 \\ \underline{12x-3y=42} \\ 14x\quad =42 \end{array}\right\}$

$x=3 \Leftrightarrow y=4\cdot 3-14=-2$

$x=3, y=-2$