1. p019e01 - Resuelve los sistemas:

(a) $\begin{cases} 3x-2y=1 \\ x+6y=7 \end{cases}$

Sol: $\begin{bmatrix} 3 & -2 & 1 \\ 0 & \frac{20}{3} & \frac{20}{3} \end{bmatrix} \rightarrow$
$\{x:1, \quad y:1\}$

(b) $\begin{cases} 6x-2y=14 \\ 3x-y=7 \end{cases}$

Sol: $\begin{bmatrix} 6 & -2 & 14 \\ 0 & 0 & 0 \end{bmatrix} \rightarrow$
$\{x:\frac{y}{3}+\frac{7}{3}\}$

(c) $\begin{cases} 6x-2y=9 \\ 3x-y=10 \end{cases}$

Sol: $\begin{bmatrix} 6 & -2 & 9 \\ 0 & 0 & \frac{11}{2} \end{bmatrix} \rightarrow$
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(d) $\begin{cases} 4x+7y=-3 \\ 7x+4y=36 \end{cases}$

Sol: $\begin{bmatrix} 4 & 7 & -3 \\ 0 & -\frac{33}{4} & \frac{165}{4} \end{bmatrix} \rightarrow$
$\{x:8, \quad y:-5\}$

(e) $\begin{cases} 4x+16=5y \\ 5y-19=3x \end{cases}$

Sol: $\begin{bmatrix} 4 & -5 & -16 \\ 0 & \frac{5}{4} & 7 \end{bmatrix} \rightarrow$
$\{x:3, \quad y:\frac{28}{5}\}$

(f) $\begin{cases} x-5=y+2 \\ 1+3x+2y=x-4 \end{cases}$

Sol: $\begin{bmatrix} 1 & -1 & 7 \\ 0 & 4 & -19 \end{bmatrix} \rightarrow$
$\{x:\frac{9}{4}, \quad y:-\frac{19}{4}\}$

(g) $\begin{cases} x-5=y+2 \\ 3x-2y=x-5 \end{cases}$

Sol: $\begin{bmatrix} 1 & -1 & 7 \\ 0 & 0 & -19 \end{bmatrix} \rightarrow$
$[]$

(h) $\begin{cases} x+3y=6 \\ 6y-5=7-2x \end{cases}$

Sol: $\begin{bmatrix} 1 & 3 & 6 \\ 0 & 0 & 0 \end{bmatrix} \rightarrow$
$\{x:-3y+6\}$

(i) $\begin{cases} x-y=8 \\ x+y=24 \end{cases}$

Sol: $\begin{bmatrix} 1 & -1 & 8 \\ 0 & 2 & 16 \end{bmatrix} \rightarrow$
$\{x:16, \quad y:8\}$

(j) $\begin{cases} x+2y=11 \\ 2x-y=2 \end{cases}$

Sol: $\begin{bmatrix} 1 & 2 & 11 \\ 0 & -5 & -20 \end{bmatrix} \rightarrow$
$\{x:3, \quad y:4\}$

(k) $\begin{cases} 3x-4y=-9 \\ 2x+y=5 \end{cases}$

Sol: $\begin{bmatrix} 3 & -4 & -9 \\ 0 & \frac{11}{3} & 11 \end{bmatrix} \rightarrow$
$\{x:1, \quad y:3\}$

(l) $\begin{cases} 10(x-2)+y=1 \\ x+3(x-y)=5 \end{cases}$

Sol: $\begin{bmatrix} 1 & 0 & 5 \\ 0 & 1 & 1 \end{bmatrix} \rightarrow$
$\{x:2, \quad y:1\}$

(m) $\begin{cases} \frac{x-y}{2}+\frac{x-y}{3}=5 \\ \frac{x+7}{4}+y=3 \end{cases}$

Sol: $\begin{bmatrix} 0 & 1 & 3 \\ 0 & 0 & 5 \end{bmatrix} \rightarrow$
$\{x:\frac{29}{5}, \quad y:-\frac{1}{5}\}$

(n) $\begin{cases} \frac{3(y+2x+2)}{4} = \frac{4x+y-1}{3} \\ \frac{1}{3}(x+y) - \frac{1}{6}(x-y) = \frac{y-1}{6} \end{cases}$

Sol: $\begin{bmatrix} -\frac{1}{3} & -\frac{4}{3} & -\frac{1}{3} \\ 0 & -\frac{1}{6} & -\frac{1}{6} \end{bmatrix} \rightarrow$
$\{x : 39, \quad y : -20\}$

(ñ) $\begin{cases} x - 2(x+y) = 3y - 2 \\ \frac{x}{3} + \frac{y}{2} = 3 \end{cases}$

Sol: $\begin{bmatrix} 1 & -3 & -2 \\ 0 & \frac{3}{2} & \frac{11}{3} \end{bmatrix} \rightarrow$
$\{x : 12, \quad y : -2\}$

(o) $\begin{cases} \frac{3-2y}{4} - \frac{1}{4} = \frac{1-2x}{6} \\ \frac{25}{8} - 1 = \frac{x+3}{2} - \frac{3(1+y)}{8} \end{cases}$

Sol: $\begin{bmatrix} \frac{1}{3} & 0 & \frac{5}{12} \\ 0 & \frac{3}{8} & -\frac{3}{8} \end{bmatrix} \rightarrow$
$\{x : 5, \quad y : 4\}$

(p) $\begin{cases} \frac{4y-5x}{6} + \frac{3x-2y}{2} = 1 - \frac{2}{9}(x+y) \\ \frac{4y+x-8}{8} - x = \frac{2(y-2x)}{3} \end{cases}$

Sol: $\begin{bmatrix} \frac{2}{9} & \frac{2}{9} & 1 \\ 0 & 1 & 3 \end{bmatrix} \rightarrow$
$\left\{x : \frac{4}{7}, \quad y : -\frac{31}{7}\right\}$

2. p021e23 - Resuelve los sistemas:

(a) $\begin{cases} x - 2y + 5z = 13 \\ 2x - 5y + z = 19 \\ x + 3y - 2z = -4 \end{cases}$

Sol: $\begin{bmatrix} -2 & 1 & 5 & 13 \\ 0 & -\frac{1}{2} & -\frac{23}{2} & -\frac{27}{2} \\ 0 & 0 & -52 & -52 \end{bmatrix} \rightarrow$
$\{x : 4, \quad y : -2, \quad z : 1\}$

(b) $\begin{cases} x - y + z = 7 \\ x + y - 3z = 1 \\ 2x + y - 4z = 5 \end{cases}$

Sol: $\begin{bmatrix} -1 & 1 & 1 & 7 \\ 0 & 2 & -2 & 8 \\ 0 & 0 & 0 & 0 \end{bmatrix} \rightarrow$
$\{x : z + 4, \quad y : 2z - 3\}$

(c) $\begin{cases} x - 2y + z = 13 \\ 3x - 4y + 2z = 1 \\ 2x - 2y + z = 0 \end{cases}$

Sol: $\begin{bmatrix} -2 & 1 & 1 & 13 \\ 0 & 1 & 0 & -25 \\ 0 & 0 & 1 & 0 \end{bmatrix} \rightarrow$
$[]$

(d) $\begin{cases} x - y + z = 1 \\ x + z = 4 \\ y - 3z = -15 \end{cases}$

Sol: $\begin{bmatrix} -1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 4 \\ 0 & 0 & -3 & -18 \end{bmatrix} \rightarrow$
$\{x : -2, \quad y : 3, \quad z : 6\}$

(e) $\begin{cases} 2x - y + z = 6 \\ x + y - 2z = 1 \\ x - 2y + 3z = 0 \end{cases}$

Sol: $\begin{bmatrix} -1 & 2 & 1 & 6 \\ 0 & 3 & -1 & 7 \\ 0 & 0 & 3 & 0 \end{bmatrix} \rightarrow$
$[]$

(f) $\begin{cases} x + 2y - 3z = 9 \\ 2x - y = 6 \\ 4x + 3y - 6z = 24 \end{cases}$

Sol: $\begin{bmatrix} 2 & 1 & -3 & 9 \\ 0 & \frac{5}{2} & -\frac{3}{2} & \frac{21}{2} \\ 0 & 0 & 0 & 0 \end{bmatrix} \rightarrow$
$\left\{x : \frac{3z}{5} + \frac{21}{5}, \quad y : \frac{6z}{5} + \frac{12}{5}\right\}$

(g) $\begin{cases} 4x - 2y = 2 \\ 6y - 3z = 1 \\ 3z - 4x = -1 \end{cases}$

Sol: $\left[\begin{array}{cccc} -2 & 4 & 0 & 2 \\ 0 & 12 & -3 & 7 \\ 0 & 0 & 2 & \frac{4}{3} \end{array}\right] \rightarrow$

$\left\{x:\frac{3}{4},\quad y:\frac{1}{2},\quad z:\frac{2}{3}\right\}$

(h) $\begin{cases} x+2y=5 \\ 2x+y=-1 \\ -x+3y=6 \end{cases}$

Sol: $\begin{bmatrix} 1 & 2 & 5 \\ 0 & -3 & -11 \\ 0 & 0 & -\frac{22}{3} \end{bmatrix} \rightarrow$

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(i) $\begin{cases} x-3y=1 \\ 4y-z=1 \\ 2x-z=1 \end{cases}$

Sol: $\begin{bmatrix} -3 & 1 & 0 & 1 \\ 0 & \frac{4}{3} & -1 & \frac{7}{3} \\ 0 & 0 & \frac{1}{2} & -\frac{5}{2} \end{bmatrix} \rightarrow$

$\{x:-2,\quad y:-1,\quad z:-5\}$

(j) $\begin{cases} x+2=-y \\ -y+3=2x \\ 4x-y=6 \end{cases}$

Sol: $\begin{bmatrix} 1 & 1 & -2 \\ 0 & 1 & -7 \\ 0 & 0 & -21 \end{bmatrix} \rightarrow$

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(k) $\begin{cases} x-2y+3z=2 \\ 2x-3y+z=1 \\ 3x-y+2z=9 \end{cases}$

Sol: $\begin{bmatrix} -2 & 1 & 3 & 2 \\ 0 & \frac{1}{2} & -\frac{7}{2} & -2 \\ 0 & 0 & 18 & 18 \end{bmatrix} \rightarrow$

$\{x:3,\quad y:2,\quad z:1\}$

(l) $\begin{cases} x-6+y=0 \\ -3y+x-2=0 \\ 5x-26+y=0 \end{cases}$

Sol: $\begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 2 \\ 0 & 0 & 0 \end{bmatrix} \rightarrow$

$\{x:5,\quad y:1\}$

(m) $\begin{cases} 2x+2y=-2 \\ x+6=y \\ 3x+5y=1 \end{cases}$

Sol: $\begin{bmatrix} 2 & 2 & -2 \\ 0 & -2 & -5 \\ 0 & 0 & -1 \end{bmatrix} \rightarrow$

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(n) $\begin{cases} x+y+z=4 \\ x-2y+3z=13 \\ x+3y+4z=11 \end{cases}$

Sol: $\begin{bmatrix} 1 & 1 & 1 & 4 \\ 0 & 3 & 5 & 21 \\ 0 & 0 & \frac{13}{3} & 13 \end{bmatrix} \rightarrow$

$\{x:2,\quad y:-1,\quad z:3\}$

(ñ) $\begin{cases} z-2(x+y)=-9 \\ 3x-y=3 \\ 3y-z=9 \end{cases}$

Sol: $\begin{bmatrix} -1 & 3 & 0 & 3 \\ 0 & 9 & -1 & 18 \\ 0 & 0 & 1 & -9 \end{bmatrix} \rightarrow$

$\{x:3,\quad y:6,\quad z:9\}$

(o) $\begin{cases} \frac{x}{2}+\frac{y}{3}+z=7 \\ x-\frac{y}{2}+\frac{z}{3}=11 \\ \frac{x}{3}-y-\frac{z}{2}=5 \end{cases}$

Sol: $\begin{bmatrix} \frac{1}{3} & \frac{1}{2} & 1 & 7 \\ 0 & \frac{7}{4} & \frac{11}{6} & \frac{43}{2} \\ 0 & 0 & \frac{73}{126} & \frac{73}{21} \end{bmatrix} \rightarrow$

$\{x:6,\quad y:-6,\quad z:6\}$

(p) $\begin{cases} \frac{x}{2}+\frac{y}{3}+\frac{z}{3}=9 \\ \frac{x}{3}-\frac{y}{9}+\frac{z}{3}=6 \\ \frac{x}{6}+\frac{y}{2}+\frac{z}{2}=13 \end{cases}$

Sol: $\begin{bmatrix} \frac{1}{3} & \frac{1}{2} & \frac{1}{3} & 9 \\ 0 & \frac{1}{2} & \frac{4}{9} & 9 \\ 0 & 0 & \frac{14}{27} & 10 \end{bmatrix} \rightarrow$

$\left\{x:\frac{6}{7},\quad y:\frac{45}{7},\quad z:\frac{135}{7}\right\}$

(q) $\begin{cases} x-y+z=5 \\ \frac{x-1}{2}+\frac{y}{3}=1 \\ \frac{2x+y}{6}-\frac{3z+y}{8}=4 \end{cases}$

Sol: $\begin{bmatrix} -1 & 1 & 1 & 5 \\ 0 & \frac{1}{3} & \frac{1}{3} & \frac{8}{3} \\ 0 & 0 & -\frac{3}{8} & \frac{35}{8} \end{bmatrix} \rightarrow$

$\left\{x : \frac{177}{29}, \quad y : -\frac{135}{29}, \quad z : -\frac{167}{29}\right\}$