

Regla de Cramer.

Problema 7:

$$7. \begin{cases} x + y - z = 5 \\ 2x - y + 3z = -3 \\ 2x + 3y = -4 \end{cases}$$

$$A = \begin{pmatrix} 1 & 1 & -1 \\ 2 & -1 & 3 \\ 2 & 3 & 0 \end{pmatrix} \begin{vmatrix} 1 & 1 \\ 2 & -1 \\ 2 & 3 \end{vmatrix} = \begin{bmatrix} 0+6-6 \\ 2+9+0 \end{bmatrix} = \begin{bmatrix} 0 \\ 11 \end{bmatrix} = -11$$

$$Ax = \begin{pmatrix} 5 & 1 & -1 \\ -3 & -1 & 3 \\ -4 & 3 & 0 \end{pmatrix} \begin{vmatrix} 5 & 1 \\ -3 & -1 \\ -4 & 3 \end{vmatrix} = \begin{bmatrix} 0-12+9 \\ -4+45+0 \end{bmatrix} = \begin{bmatrix} -3 \\ 41 \end{bmatrix} = -44$$

$$Ay = \begin{pmatrix} 1 & 5 & -1 \\ 2 & -3 & 3 \\ 2 & -4 & 0 \end{pmatrix} \begin{vmatrix} 1 & 5 \\ 2 & -3 \\ 2 & -4 \end{vmatrix} = \begin{bmatrix} 0+30+8 \\ 6-12+0 \end{bmatrix} = \begin{bmatrix} 38 \\ -6 \end{bmatrix} = 44$$

$$Az = \begin{pmatrix} 1 & 1 & 5 \\ 2 & -1 & -3 \\ 2 & 3 & -4 \end{pmatrix} \begin{vmatrix} 1 & 1 \\ 2 & -1 \\ 2 & 3 \end{vmatrix} = \begin{bmatrix} 4-6+30 \\ -10-9-8 \end{bmatrix} = \begin{bmatrix} 28 \\ -27 \end{bmatrix} = 55$$

$$x = \frac{-44}{-11} = +4$$

$$y = \frac{44}{-11} = -4$$

$$z = \frac{55}{-11} = -5$$

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

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Problema 8.

$$8: \begin{cases} 2x + y - z = -1 \\ 3x + 3y + z = 9 \\ x - 2y + 4z = 8 \end{cases}$$

$$A = \begin{pmatrix} 2 & 1 & -1 & 2 & 1 \\ 3 & 3 & 1 & 3 & 3 \\ 1 & -2 & 4 & 1 & -2 \end{pmatrix} \begin{matrix} [24+1+6] - \\ [-3-4+12] \\ 31-5=26 \end{matrix}$$

$$Ax = \begin{pmatrix} -1 & 1 & 1 & -1 & 1 \\ 9 & 3 & 1 & 9 & 3 \\ 8 & -2 & 4 & 8 & -2 \end{pmatrix} \begin{matrix} [-12+8-18] - \\ [24+2+36] \\ -22-62 = -84 \end{matrix}$$

$$Ay = \begin{pmatrix} 2 & -1 & -1 & 2 & -1 \\ 3 & 9 & 1 & 3 & 9 \\ 1 & 8 & 4 & 1 & 8 \end{pmatrix} \begin{matrix} [32-1-24] - \\ [-9+16-12] \\ 47+5 = 52 \end{matrix}$$

$$Az = \begin{pmatrix} 2 & 1 & -1 & 2 & 1 \\ 3 & 3 & 9 & 3 & 3 \\ 1 & -2 & 8 & 1 & -2 \end{pmatrix} \begin{matrix} [48+9+6] - \\ [-3-36+2-1] \\ 63+18 = 78 \end{matrix}$$

$$x = \frac{-84}{26} = -3.2307$$

$$y = \frac{52}{26} = 2$$

$$z = \frac{78}{26} = 3$$

Problema 9

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$$q = \begin{cases} 2x - y + 3z = 13 \\ 3y + z = 5 \\ x - 7y + z = -1 \end{cases}$$

$$A = \begin{pmatrix} 2 & -1 & 3 & 2 & -1 \\ 0 & 3 & 1 & 0 & 3 \\ 1 & -7 & 1 & 1 & -7 \end{pmatrix} = \begin{bmatrix} 6 & -1 & 0 \\ 9 & -14 & 0 \end{bmatrix} = 5 + 5 = 10$$

$$Ax = \begin{pmatrix} 13 & -1 & 3 & 13 & -1 \\ 5 & 3 & 1 & 5 & 3 \\ -1 & -7 & 1 & -1 & -7 \end{pmatrix} = \begin{bmatrix} 9 & -9 & -5 \\ 39 & 1 & -105 \end{bmatrix} = 40$$

$$Ay = \begin{pmatrix} 2 & 13 & 3 & 2 & 13 \\ 0 & 5 & 1 & 0 & 5 \\ 1 & -1 & 1 & 1 & -1 \end{pmatrix} = 10$$

$$Az = \begin{pmatrix} 2 & -1 & 13 \\ 0 & 3 & 5 \\ 1 & -7 & -1 \end{pmatrix} = 20$$

$$x = \frac{40}{10} = 4$$

$$y = \frac{10}{10} = 1$$

$$z = \frac{20}{10} = 2$$

$$A = \begin{pmatrix} 2 & -1 & 3 & 2 & -1 \\ 0 & 3 & 1 & 0 & 3 \\ 1 & -7 & 1 & 1 & -7 \end{pmatrix}$$