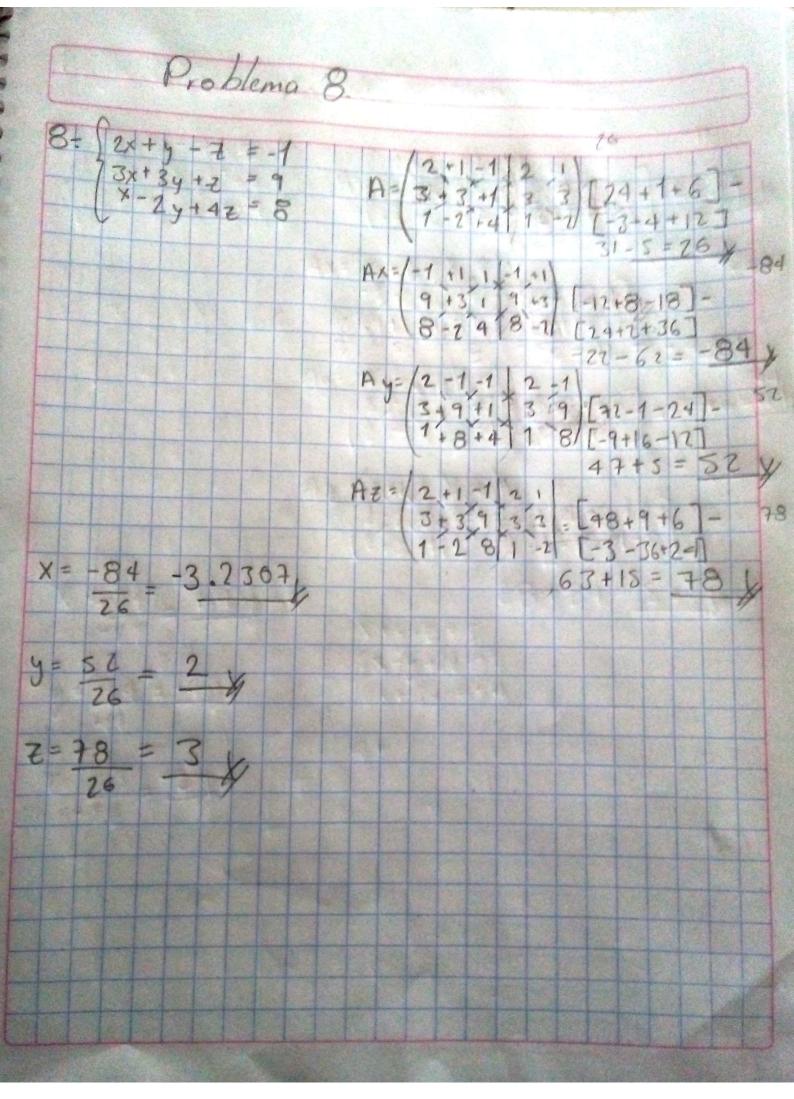Algebra lineal

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TSP

Ingeniería en sistemas computacionales

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

-11

$A=\begin{pmatrix} 1 & 1 & -1 & 1 & 1 \\ 2 & -1 & 3 & 2 & -1 \\ 2 & 3 & 0 & 2 & 3 \end{pmatrix} = \dfrac{[0+6-6]}{[2+9+0]} = -11$

-44

$Ax=\begin{pmatrix} 5 & 1 & -1 & 5 & 1 \\ -3 & -1 & 3 & -3 & -1 \\ -4 & 3 & 0 & -4 & 3 \end{pmatrix} = \dfrac{[0-12+9]}{-[-4+45+0]}$

$-3-41=-44$

$Ay=\begin{pmatrix} 1 & 5 & -1 & 1 & 5 \\ 2 & -3 & 3 & 2 & -3 \\ 2 & -4 & 0 & 2 & -4 \end{pmatrix} = \dfrac{[0+30+8]}{-[6-12+0]}$

$38+6=\underline{44}$ 44

$Az=\begin{pmatrix} 1 & 1 & 5 & 1 & 1 \\ 2 & -1 & -3 & 2 & -1 \\ 2 & 3 & -4 & 2 & 3 \end{pmatrix} = \dfrac{[4-6+30]}{-[-10-9-8]}$

$28+27=\underline{55}$

$X=\dfrac{-44}{-11}=+4$

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

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

Problema 8

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

$A = \begin{pmatrix} 2 & 1 & -1 \\ 3 & 3 & 1 \\ 1 & -2 & 4 \end{pmatrix} \begin{vmatrix} 2 & 1 \\ 3 & 3 \\ 1 & -2 \end{vmatrix}$ $\begin{array}{l} [24+1+6]- \\ [-3-4+12] \end{array}$

$31 - 5 = 26$ ✗ ← 84

$A_x = \begin{pmatrix} -1 & 1 & -1 \\ 9 & 3 & 1 \\ 8 & -2 & 4 \end{pmatrix} \begin{vmatrix} -1 & 1 \\ 9 & -3 \\ 8 & -2 \end{vmatrix}$ $\begin{array}{l} [-12+8-18]- \\ [24+2+36] \end{array}$

$-22 - 62 = -84$ ✗ ← 52

$A_y = \begin{pmatrix} 2 & -1 & -1 \\ 3 & 9 & 1 \\ 1 & 8 & 4 \end{pmatrix} \begin{vmatrix} 2 & -1 \\ 3 & 9 \\ 1 & 8 \end{vmatrix}$ $\begin{array}{l} [72-1-24]- \\ [-9+16-12] \end{array}$

$47 + 5 = 52$ ✗ ← 78

$A_z = \begin{pmatrix} 2 & 1 & -1 \\ 3 & 3 & 9 \\ 1 & -2 & 8 \end{pmatrix} \begin{vmatrix} 2 & 1 \\ 3 & 3 \\ 1 & -2 \end{vmatrix}$ $\begin{array}{l} [48+9+6]- \\ [-3-36+2] \end{array}$

$63 + 15 = 78$ ✗

$X = \dfrac{-84}{26} = -3.2307$ ✗

$y = \dfrac{52}{26} = 2$ ✗

$z = \dfrac{78}{26} = 3$ ✗

Problema 9

$$9 = \begin{cases} 2x - y + 3z = 13 \\ 3y + z = 5 \\ x - 7y + z = -1 \end{cases}$$

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

40

$$Ax = \begin{pmatrix} 13 & -1 & +3 & 13 & -1 \\ 5 & 3 & +1 & 5 & 3 \\ -1 & -7 & +1 & -1 & -7 \end{pmatrix} = \frac{[9-91-5]}{-[39+1-105]} = 40$$

10

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

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

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

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

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

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