· ELIMINACIÓN POR GAUSS-JORDAN

$\begin{cases} x+5y=7 \\ -2x-7y=-5 \end{cases}$ matriz identidad $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

matriz ampliada $\left|\begin{matrix} 1 & 5 & 7 \\ -2 & -7 & -5 \end{matrix}\right|$ $F_2 = F_2 + 2F_1$

$-2+2.1=0$
$-7+2.5=3$
$-5+2.7=9$

$\left|\begin{matrix} 1 & 5 & 7 \\ 0 & 3 & 9 \end{matrix}\right|$ $F_2 = \frac{1}{3}F_2$

$0.\frac{1}{3}=0$
$3.\frac{1}{3}=1$
$9.\frac{1}{3}=3$

$\left|\begin{matrix} 1 & 5 & 7 \\ 0 & 1 & 3 \end{matrix}\right|$ $F_1 = F_1 - 5F_2$

$1-5.0=1$
$5-5.1=0$
$7-5.3=-8$

$\left|\begin{matrix} 1 & 0 & -8 \\ 0 & 1 & 3 \end{matrix}\right|$ $x=-8$, $y=3$

$\begin{cases} 2x+y=7 \\ x+2y=8 \end{cases}$ matriz identidad $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

matriz ampliada $\left(\begin{matrix} 2 & 1 & 7 \\ 1 & 2 & 8 \end{matrix}\right)$ $F_1 \to F_1 - F_2$, $F_2 \to 2F_2 - F_1$

$2-1=1$
$1-2=-1$
$2-8=-1$
$2.1-2=0$
$2.2-1=3$
$2.8-7=9$

$\left(\begin{matrix} 1 & -1 & -1 \\ 0 & 3 & 9 \end{matrix}\right)$ $F_2 = \frac{1}{3}F_2$

$\frac{1}{3}.0=0$
$\frac{1}{3}.3=1$
$\frac{1}{3}.9=3$

$\left(\begin{matrix} 1 & -1 & -1 \\ 0 & 1 & 3 \end{matrix}\right)$ $F_1 = F_1 + F_2$

$1+0=1$
$-1+1=0$
$-1+3=2$

$\left(\begin{matrix} 1 & 0 & 2 \\ 0 & 1 & 3 \end{matrix}\right)$ $x=2$, $y=3$

Ej 7. Sección 2

Matriz Identidad $\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

$x_1 + x_2 - x_3 = 7$
$4x_1 - x_2 + 5x_3 = 4$
$2x_1 + 2x_2 - 3x_3 = 0$

Matriz Ampliada $\left|\begin{matrix} 1 & 1 & -1 & 7 \\ 4 & -1 & 5 & 4 \\ 2 & 2 & -3 & 0 \end{matrix}\right|$ $F_2 \to F_2 - 2F_3$, $F_3 \to F_3 - 2F_1$

$4-2.2=4-4=0$
$-1-2.2=-1-4=-5$
$5-2.-3=5+6=11$
$4-2.0=4$
$2-2.1=2-2=0$
$-3-2(-1)=-3+2=-1$
$0-2.7=-14$

$\left|\begin{matrix} 1 & 1 & -1 & 7 \\ 0 & -5 & 11 & 4 \\ 0 & 0 & -1 & -14 \end{matrix}\right|$ $F_2 \to -\frac{1}{5}.F_2$, $F_3 \to (-1)F_3$

$0.-\frac{1}{5}=0$
$-5.-\frac{1}{5}=+1$
$11.-\frac{1}{5}=-\frac{11}{5}$
$4.-\frac{1}{5}=-\frac{4}{5}$

$\left|\begin{matrix} 1 & 1 & -1 & 7 \\ 0 & 1 & -11/5 & -4/5 \\ 0 & 0 & 1 & 14 \end{matrix}\right|$ $F_1 \to F_1 - F_2$, $F_2 \to F_2 + \frac{11}{5}.F_3$

$-1-\left|-\frac{4}{5}\right| = -1+\frac{11}{5} = \frac{6}{5}$
$7-\left|-\frac{4}{5}\right| = 7+\frac{4}{5} = \frac{39}{5}$
$-\frac{4}{5}+\frac{11.14}{5} = -\frac{4}{5}+\frac{154}{5} = \frac{150}{5} = 30$

$\left|\begin{matrix} 1 & 0 & 6/5 & 39/5 \\ 0 & 1 & 0 & 30 \\ 0 & 0 & 1 & 14 \end{matrix}\right|$ $F_1 \to F_1 - \frac{6}{5}.F_3$

$\frac{39}{5}-\frac{6}{5}.14 = \frac{39}{5}-\frac{84}{5} = -\frac{45}{5} = -9$

$\left|\begin{matrix} 1 & 0 & 0 & -9 \\ 0 & 1 & 0 & 30 \\ 0 & 0 & 1 & 14 \end{matrix}\right|$ $x_1 = -9$, $x_2 = 30$, $x_3 = 14$

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