Punto 1:

$$A = \begin{bmatrix} 1 & 1 \\ 1\times10^{-4} & 1 \end{bmatrix} \quad B = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$$

a) Solución exacta

Con 5

$$\begin{bmatrix} 1.00010\ldots \\ 0.99989\ldots \end{bmatrix}$$

Con Redondeo 3

$$\begin{bmatrix} 1.000 \\ 0.999 \end{bmatrix}$$

b) Solución Manual

$$Ax = B$$

$$x = B\cdot$$

$$\left[\begin{array}{cc|c} 1 & 1 & 2 \\ 10^{-4} & 1 & 1 \end{array}\right]$$

$$F_1 \cdot 10^{-4} - F_2 \quad \left[\begin{array}{cc|c} 1 & 1 & 2 \\ 0 & -0.9999 & -1.9999 \end{array}\right]$$

$$y = \frac{-1.9999}{0.9999}$$

$$\boxed{y = 2.00010001}$$

$$x + y = 2$$

$$\boxed{x = -1.00010001 \times 10^{-4}}$$

Punto 2

A

-10	7	4	-2	7	-14	-1	3	9	5
-15	-11	-8	-11	-10	-13	9	-4	7	-13
7	10	-7	-9	10	6	-6	4	-15	0
-5	-3	-4	-10	3	-8	-2	-7	10	-7
1	-14	-1	1	8	-12	0	-3	-14	-5
-1	-4	10	-12	-5	0	1	-12	1	-8
-13	10	10	8	-9	-14	-11	-2	4	2
7	1	-9	5	-3	-13	-10	-11	-15	-7
-6	-13	8	2	-4	-5	6	-2	-1	-7
-11	-8	10	-11	-8	-15	14	9	-13	1

B

$$\begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \end{bmatrix}$$

de iteraciones de cramer : 11000

→ # iteraciones de un det 10x10 : 1000

Gauss = 1000

Cramer necesita 11 veces mas iteraciones

Punto 3

$$A = \begin{bmatrix} 4 & -1 & -1 \\ -1 & 4 & -1 \\ -1 & -1 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

Solución exacta

$$\begin{bmatrix} 4/5 \\ 1 \\ 6/5 \end{bmatrix}$$

Solución por Gauss

$$\left[\begin{array}{ccc|c} 4 & -1 & -1 & 1 \\ -1 & 4 & -1 & 2 \\ -1 & -1 & 4 & 3 \end{array}\right]$$

$F_1/4$

$$\left[\begin{array}{ccc|c} 1 & -1/4 & -1/4 & 1 \\ -1 & 4 & -1 & 2 \\ -1 & -1 & 4 & 3 \end{array}\right]$$

$F_1 + F_2$

$$\left[\begin{array}{ccc|c} 1 & -1/4 & -1/4 & 1/4 \\ 0 & 15/4 & -5/4 & 9/4 \\ -1 & -1 & 4 & 3 \end{array}\right]$$

$F_1 + F_3$

$$\left[\begin{array}{ccc|c} 1 & -1/4 & -1/4 & 1/4 \\ 0 & 15/4 & -5/4 & 9/4 \\ 0 & -5/4 & 15/4 & 13/4 \end{array}\right]$$

$F_2 \cdot 4$ y $F_3 \cdot 4$

$$\left[\begin{array}{ccc|c} 1 & -1/4 & -1/4 & 1/4 \\ 0 & 15 & -5 & 9 \\ 0 & -5 & 15 & 13 \end{array}\right]$$

$F_2/15$

$$\left[\begin{array}{ccc|c} 1 & -1/4 & -1/4 & 1/4 \\ 0 & 1 & -1/3 & 3/5 \\ 0 & -5 & 15 & 13 \end{array}\right]$$

$F_2 \cdot 5 + F_3$

$$\left[\begin{array}{ccc|c} 1 & -1/4 & -1/4 & 1/4 \\ 0 & 1 & -1/3 & 3/5 \\ 0 & 0 & 40/3 & 16 \end{array}\right]$$

$$Z\left(\frac{40}{3}\right) = 16$$

$$\boxed{Z = 6/5}$$

$$y - \frac{1}{3} \cdot z = 3/5$$

$$y = \frac{3}{5} + \frac{6}{15}$$

$$\boxed{y = 1}$$

$$x - \frac{1}{4} - \frac{1}{4}\left(\frac{6}{5}\right) = \frac{1}{4}$$

$$\boxed{x = \frac{4}{5}}$$

Punto 4

$$A=\begin{bmatrix} 2.6 & 0.3 & 2.4 & 6.2 \\ 7.7 & 0.4 & 4.7 & 1.4 \\ 5.1 & 9.9 & 9.9 & 1.5 \\ 6 & 7.0 & 8.5 & 4.8 \end{bmatrix} \quad B=\begin{bmatrix} 50.78 \\ 47.36 \\ 41.48 \\ 98.17 \end{bmatrix}$$

a) Solución por wolfram

$$\begin{bmatrix} 2.5 \\ 3.2 \\ 4.1 \\ 5.4 \end{bmatrix}$$

% de cambio

b) Cambio 6 por 6.1

$$\begin{bmatrix} 0.149421 \\ 0.418223 \\ 8.34325 \\ 4.87778 \end{bmatrix}$$

B	c	d
44.023%	70.9564%	123.3716 %
86.9355%	66.31875%	115.3646 %
103.4934%	78.7431 %	136.9773 %
9.67 %	7.45 %	12.9598 %

b) Cambio 4.7 por 4,8

$$\begin{bmatrix} 4.27391 \\ 5.3222 \\ 0.871532 \\ 5.8023 \end{bmatrix}$$

D) Cambio 4.7 por 4,6

$$\begin{bmatrix} 5.58921 \\ 6.89167 \\ -1.51607 \\ 6.09983 \end{bmatrix}$$