6.9.b

$$X_{k+1} = X_k - \frac{f(X_k)}{f'(X_k)}, \quad \text{para } k = 0, 1, 2, 3\ldots$$

$f(x) = 0.95x^3 - 5.9x^2 + 10.9x - 6$, $X_0 = 3.5$

$f'(x) = 2.85x^2 - 11.8x + 10.9$

$$X_1 = X_0 - \frac{f(X_0)}{f'(X_0)} = 3.36565097$$

$$X_2 = X_1 - \frac{f(X_1)}{f'(X_1)} = 3.34512276$$

$$X_3 = X_2 - \frac{f(X_2)}{f'(X_2)} = 3.34645432$$

k	X_k
0	3.5
1	3.3656...
2	3.3451...
3	3.3446...

6.9.C

$$X_{K+1} = X_K - \left(\frac{X_K - X_{K-1}}{f(X_K) - f(X_{K-1})} \right) f(X_K)$$

$X_0 = 2.5$

$X_1 = 3.5$

$$X_2 = X_1 - \left(\frac{X_1 - X_0}{f(X_1) - f(X_0)} \right) f(X_1) = 3.063063063$$

$$X_3 = X_2 - \left(\frac{X_2 - X_1}{f(X_2) - f(X_1)} \right) f(X_2) = 3.291906237$$

$$X_4 = X_3 - \left(\frac{X_3 - X_2}{f(X_3) - f(X_2)} \right) f(X_3) = 3.367092104$$

K	X_K
0	2.5
1	3.5
2	3.0630...
3	3.2919...
4	3.3670...

10.4

$$2x_1 - 6x_2 - x_3 = -38$$
$$-3x_1 - x_2 + 7x_3 = -34$$
$$-8x_1 + x_2 - 2x_3 = -20$$

Encontrando L $\rightarrow L = \begin{pmatrix} 1 & 0 & 0 \\ -1.5 & 1 & 0 \\ -4 & 2.3 & 1 \end{pmatrix}$

Realizando operaciones elementales

$$\begin{pmatrix} 2 & -6 & -1 \\ -3 & -1 & 7 \\ -8 & 1 & -2 \end{pmatrix} \xrightarrow[4f_1 + f_2]{1.5f_1 + f_2} \begin{pmatrix} 2 & -6 & -1 \\ 0 & -10 & 5.5 \\ 0 & -23 & -6 \end{pmatrix}$$

Se agrega a L los opuestos de los multiplicadores

$$\xrightarrow{-2.3f_2 + f_3} \begin{pmatrix} 2 & -6 & -1 \\ 0 & -10 & 5.5 \\ 0 & 0 & -18.65 \end{pmatrix}$$

Encontrando U

$$\begin{pmatrix} 2 & -6 & 1 \\ -3 & -1 & 7 \\ -8 & 1 & -2 \end{pmatrix} \xrightarrow[4f_1 + f_3]{1.5f_1 + f_2} \begin{pmatrix} 2 & -6 & -1 \\ 0 & -10 & 5.5 \\ 0 & -23 & -6 \end{pmatrix}$$

$$\xrightarrow{-2.3f_2 + f_3} \begin{pmatrix} 2 & -6 & -1 \\ 0 & -10 & 5.5 \\ 0 & 0 & -18.65 \end{pmatrix}$$

$$\underbrace{\begin{pmatrix} 1 & 0 & 0 \\ -1.5 & 1 & 0 \\ -4 & -2.3 & 1 \end{pmatrix}}_{L} \underbrace{\begin{pmatrix} 2 & -6 & -1 \\ 0 & -10 & 5.5 \\ 0 & 0 & -16.65 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix}}_{Y} = \begin{pmatrix} -38 \\ -34 \\ -20 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 & 0 \\ -1.5 & 1 & 0 \\ -4 & -2.3 & 1 \end{pmatrix} \begin{pmatrix} y_1 \\ y_2 \\ y_3 \end{pmatrix} = \begin{pmatrix} -38 \\ -34 \\ -20 \end{pmatrix}$$

$$\begin{pmatrix} y_1 \\ y_2 \\ y_3 \end{pmatrix} = \begin{pmatrix} -38 \\ -91 \\ 37.3 \end{pmatrix}$$

$$\begin{pmatrix} 2 & 6 & -1 \\ 0 & -10 & 5.5 \\ 0 & 0 & -18.15 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} -38 \\ -91 \\ 37.3 \end{pmatrix}$$

$$\begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 4 \\ 8 \\ -2 \end{pmatrix}$$