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Ans to the question no: 3 (a)

$$(b+2)x - (a+2)y - (c+1)z = 5$$

$$-(a+1)x - (c+1)y + (b+3)z = -12$$

$$(b+1)x + (a+3)y + (c+1)z = 9$$

Now, $a = 1$, $b = 0$, and $c = 6$

$$(0+2)x - (1+2)y - (6+1)z = 5$$

$$-(1+1)x - (6+1)y + (0+3)z = -12$$

$$(0+1)x + (1+3)y + (6+1)z = 9$$

$$2x - 3y - 7z = 5$$

$$-2x - 7y + 3z = -12$$

$$x + 4y + 6z = 9$$

from ,

first row divided by 3.5 and second row divided by 3

$$\begin{bmatrix} 1 & -1.5 & 0 & 0 \\ 0 & -7 & 0 & -4 \\ 1 & 4 & 6 & 12 \end{bmatrix}$$

first row divided by -1.5 and second row divided by -7 and 3rd row divided by 6

$$\begin{bmatrix} -0.67 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0.57142 \\ 0.67 & 0.67 & 1 & 2 \end{bmatrix}$$

first row divided by 0.67 and third row divided by 0.67

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0.57142 \\ 0 & 0 & 1 & 2 \end{bmatrix}$$

The matrix form,

$$\begin{bmatrix} 2 & -3 & 7 \\ 0 & -7 & 3 \\ 1 & 4 & 6 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 5 \\ -12 \\ 9 \end{bmatrix}$$

The argumented form,

$$\left[\begin{array}{ccc|c} 2 & -3 & 7 & 7 \\ 0 & -7 & 3 & -4 \\ 1 & 4 & 6 & 12 \end{array}\right]$$

first row divided by 2

$$\left[\begin{array}{ccc|c} 1 & -1.5 & 3.5 & 3.5 \\ 0 & -7 & 3 & -4 \\ 1 & 4 & 6 & 12 \end{array}\right]$$

Ans to the question no: 3 (b)

$$2x - 3y - 7z = 5$$

$$0 - 7y + 3z = -12$$

$$x + 4y + 6z = 9$$

Rewriting the set of eqn in the form,

$$x = \frac{5 + 3y + 7z}{2}$$

$$y = \frac{-12 + 0 + 3z}{3}$$

$$z = \frac{9 - 1 - 4}{6}$$

Iteration : 1

Assuming $y = 0$ and $z = 0$

$$x = \frac{5 + 0 + 0}{2} = 2.5$$

Now, $x = 2.5$, $z = 0$

$$y = \frac{-12 + 0 - 3}{3} = -5$$

$$z = \frac{9 - 1(2.5) - 4}{6}$$

$$= 0.41667$$

Iteration: 2

$$x = \frac{5 + 3(-5) + 7(0.41667)}{2} = -\frac{7.08331}{2}$$

$$= -3.541655$$

$$y = \frac{-12 + 0(2.5) - 3(0.41667)}{3} = -4.4161$$

$$z = \frac{9 - 1(2.5) - 4(-5)}{6} = 9.834$$

Iteration 3:

$$x = \frac{5 + 3(-4.4161) + 7(9.834)}{2} = 0.4161$$

$$y = \frac{-12 + 0 \times (3.541655) - 3(9.834)}{3} = 4.618$$

$$z = \frac{9 - 1(3.541655) - 4(-4.4161)}{6} = 8.132$$

Iteration : 4

$$x = \frac{5 + 3(4.618) + 7(8.132)}{2} = -18.651$$

$$y = \frac{-12 + 0x(0.4161) - 3(8.132)}{3} = 22.618$$

$$z = \frac{9 - 1(0.4161) - 4(4.618)}{6} = 9.48$$

Iteration 5

$$x = \frac{5 + 3(22.618) + 7(9.48)}{2} = 2.48$$

$$y = \frac{-12 + 0x(-18.651) - 3(9.48)}{3} = 10.48$$

$$z = \frac{9 - 1(-18.651) - 4(22.618)}{6} = 9.48$$

This iteration are incomplete

Am to the question no: 1

Given

$$f(x) = (b+6)x^3 - (c+2)x - (a+1)e^{-x}$$

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$$a = 1, \quad b = 0, \quad c = 6$$

$$f(x) = (0+6)x^3 - (6+2)x - (1+1)e^{-x}$$

$$= 6x^3 - 8x - 2e^{-x}$$

first differentiat of $f(x)$

$$= 18x^2 - 8 - e^{-x}$$

suppose, $a = 0$

$b = 1$

$$f(a) = f(0) = 18 \times 0^2 - 8 - e^0$$

$$= -8 - 1$$

$$= -9$$

$f(b) = f(1) = 18(1)^2 - 8 + e^{-1}$

$= 18 - 8 - .367$

$= 9.633$

$f(a) \times f(b) < 0$ so Now

x_n	$f(x_n)$	$f'(x_n)$	$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$
0	-1	-4	$x_1 = 0 - \frac{-1}{-4} = -0.25$
-0.25	-0.26	-1.40	$x_2 = (-0.25) - \frac{-1.26}{-1.40}$ $= -0.435$
-0.435	-0.60	4.16	$x_3 = (-.436) - \frac{-0.69}{4.16}$ $= -0.29$
-0.29	0.25	-0.43	$x_4 = (-0.29) - \frac{0.25}{0.43}$ $= 0.87$
-0.87	-5.94	29.4	$x_5 = (0.07) - \frac{-5.94}{29.4}$ $= 0.66$

x_n	$f(x_n)$	$f'(x_n)$	
-0.66	-2.94	15.11	$x_6 = (0.66) - \frac{2.94}{15.11}$ $= -0.46$
-0.46	-0.74	5.115	$x_7 = (-0.46) - \frac{-0.74}{5.15}$ $= 0.316$

Root $= -0.46$

Ans to the question no: 2

a=1, b=0, c=6

we have to calculate f(3.4) so i chose

(2.3, 10), (3.7, 5.4), (4.1, 9.8)

$$f(x) = \sum_{i=0}^{2} l_i(x)\, f(x_i)$$

$$= L_0(x) f(x_0) + L_1(x) + f(x_1) + L_2(x) f(x_2)$$

$$L_0 = \prod_{j=0,\ j\neq 0} \frac{x - x_j}{x_i - x_j}$$

$$= \left(\frac{x-x_1}{x_0 - x_1}\right)\left(\frac{x-x_2}{x_0 - x_2}\right)$$

$$= \frac{(x-3.7)(x-4.1)}{(2.3-3.7)(2.3-4.1)}$$

$$= \frac{x^2 - 4.1x - 3.7x + 15.17}{-1.4 \times (-1.8)}$$

$$= \frac{x^2 - 7.8x + 15.17}{2.52}$$

using the value in equations:

$$\frac{x^2 - 7.8x + 15.17}{2.56} \times 10 + \frac{x^2 - 6.4x + 9.43}{-0.56} \times 9.4 +$$

$$\frac{x^2 - 6x + 8.51}{0.72} \times 9.8$$

$$= \frac{9x^2 - 54.8x + 73.08}{2.56} + \frac{9.4x^2 - 54.4x + 82.4}{-0.56} +$$

$$\frac{9.8x^2 - 54.8x + 81.69}{0.72}$$

$$= \frac{x\left(9x - 54.8 + 73.08\right)}{2.5} + \frac{x\left(9.4 - 54.4 + 82.4\right)}{-0.56} +$$

$$\frac{x\left(9.8x - 54.8 + 81.89\right)}{0.72}$$

$$= \frac{9x - 54.8 + 73.08 + 9.4 - 54.4 + 82.43 + 9.4x - 54.8 + 81.8}{4.81}$$

$$= \frac{133x - 781.4}{4.81}$$

$$= 132.4$$

Ans