

$$1 \quad (x_2 - 2x_2 - x_3 + 3x_2) = 10$$

$$2x + 3x_2 + x_4 = 8$$

$$x_2 - 4x_3 - 2x_2 = 3$$

$$-x_2 + 3x_3 + x_2 = -7$$

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

$$B = \begin{pmatrix} 10 \\ 8 \\ 3 \\ -7 \end{pmatrix}$$

soln := solve(M, B)

$$\text{soln} = \begin{pmatrix} -1 \\ 2 \\ -3 \\ 4 \end{pmatrix}$$

$$2 \quad y = \sin(0.25t) + 2t + e^{-0.25t} - 2 \cos\left(\frac{\pi}{10}\right)t$$

evaluation over the complex plane yields

$$y = \sin(0.25t) + 2t + \exp(-.85 \cdot \exp(1)) - 2 \cos\left(\frac{\pi}{10}\right)t$$

by factoring, yields

$$y = \sin\left(\frac{1}{4} \cdot t\right) + 2 \cdot t + \exp\left(\frac{-17}{20} \cdot \exp(1)\right) - \frac{1}{2} \cdot \sqrt{2} \cdot (5 + \sqrt{5}) \cdot \left(\frac{1}{2}\right) \cdot t$$

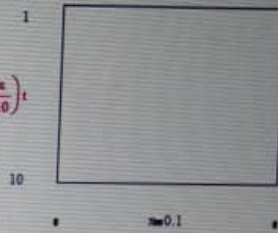
$$0 \leq t \leq 10 \quad \Delta t = 0.1$$

expands to

$$0 \leq t \leq 10$$

$$y = \sin(0.25t) + 2t + e^{-0.25t} - 2 \cos\left(\frac{\pi}{10}\right)t$$

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18/ENG04/048

Elect/Elect

1) The set of material of a system is as given in equation (1) with the aid of matrix method estimate the values of the x 's in the model equation.

$$\begin{cases} x_1 - 2x_2 - x_3 + 3x_4 = 10 \\ 2x_1 + 3x_2 + 4 = 8 \\ x_1 - 4x_3 - 2x_4 = 3 \\ -2x_2 + 3x_3 + 2x_4 = 7 \end{cases}$$

$$A = \begin{bmatrix} 1 & -2 & -1 & 3 \\ 2 & 3 & 0 & 1 \\ 1 & 0 & -4 & -2 \\ 0 & -1 & 3 & 1 \end{bmatrix}$$

$$C = \begin{bmatrix} 10 \\ 8 \\ 3 \\ 7 \end{bmatrix}$$

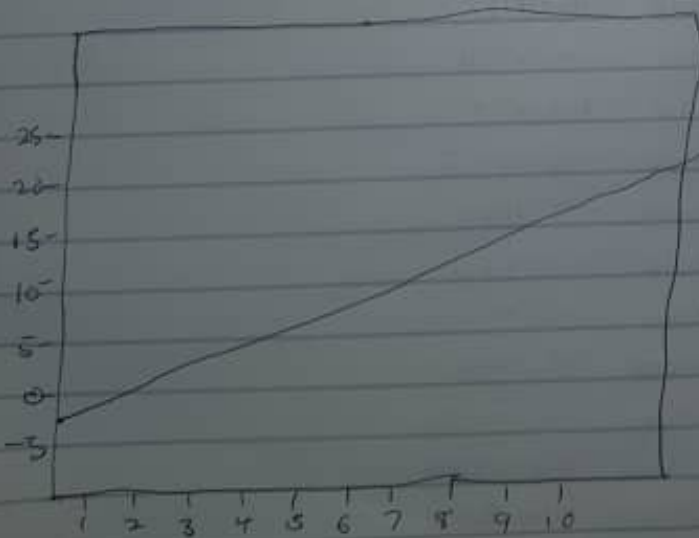
$$D = \begin{bmatrix} 0.0267 & 0.2400 & 0.4933 & 0.6667 \\ -0.0933 & 0.1600 & -0.2267 & -0.3333 \\ -0.1667 & 0.0400 & 0.0267 & 0.3333 \\ 0.2267 & 0.0400 & -0.3067 & -0.3333 \end{bmatrix}$$

$$E = -1.0000$$

$$2.0000$$

$$-3.0000$$

$$4.0000$$



4.3000	9.0692	7.5000	17.3900
4.4000	9.3402	7.6000	17.6054
4.5000	9.6112	7.7000	17.8396
4.6000	9.8821	7.8000	18.0713
4.7000	10.1529	7.9000	18.3009
4.8000	10.4234	8.0000	18.5284
4.9000	10.6935	8.1000	18.7538
5.0000	10.9632	8.2000	18.9790
5.1000	11.2325	8.3000	19.1979
5.2000	11.5012	8.4000	19.4166
5.3000	11.7692	8.5000	19.6331
5.4000	12.0365	8.6000	19.8472
5.5000	12.3031	8.7000	20.0591
5.6000	12.5698	8.8000	20.2688
5.7000	12.8335	8.9000	20.4758
5.8000	13.0978	9.0000	20.6807
5.9000	13.3600	9.1000	20.8833
9.2000	21.8832		
9.3000	21.2810		
9.4000	21.4764		
9.5000	21.4894		
9.6000	21.5694		
9.7000	21.0482		
9.8000	22.2341		
9.9000	22.4175		
10.0000	22.5987		

The model equation $y = \sin(\pi/25t) + 2t - 0.5t^2 - 2 \cos(\pi/10t)$

$0 \leq t \leq 10$ hours, $\Delta t = 0.1$

$t = 0: 0.1: 10$

$y = \sin(\pi/25t) + 2t - 0.5t^2 - 2 \cos(\pi/10t)$, plot(t,y)

[t'y'] 1.4000 1.6375

0.1-0.000 1.5000 1.8632

0.1000-0.00655 1.6000 2.0935

0.2000-0.0254 1.7000 2.3266

0.3000-0.0513 1.8000 2.5628

0.4000-0.0826 1.9000 2.8021

0.5000-0.1169 2.0000 3.0441

0.6000-0.1544 2.1000 3.2887

0.7000-0.1933 2.2000 3.5358

0.8000-0.2361 2.3000 3.7852

0.9000 0.2829 2.4000 4.0362

1.0000 0.3327 2.5000 4.2903

1.1000 0.3824 2.6000 4.5458

1.2000 1.4366 2.7000 4.8030

1.3000 1.4150 2.8000 5.0619

2.9000 5.3223 6.0000 13.6216

3.0000 5.841 6.1000 13.9920

3.1000 5.8730 6.2000 14.1412

3.2000 6.1116 6.3000 14.3990

3.3000 6.3770 6.4000 14.6555

3.4000 6.6433 6.5000 14.9105

3.5000 6.9106 6.6000 15.1640

3.6000 7.1789 6.7000 15.4160

3.7000 7.4474 6.8000 15.6664

2.8000 7.7167 7.0000 15.6664

3.9000 7.7167 7.1000 16.4074

4.0000 7.9866 7.2000 16.6509

4.1000 8.2569 7.3000 16.8925

4.2000 8.5274 7.4000 17.1322