

CLUTE ENGINEERING
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MATH ASSIGNMENT

MATH CAD

$$\textcircled{1} \begin{cases} x_1 = 3x_2 - x_3 + 2x_4 = \\ 2x_1 + 3x_2 + x_3 = 3 \\ x_1 - 4x_3 - 3x_4 = 3 \\ x_3 + 8x_5 + x_4 \end{cases}$$

$$\text{Let } A = \begin{bmatrix} 1 & -2 & -1 & 3 \\ 2 & 3 & 2 & 1 \\ 1 & 0 & -4 & -2 \\ 0 & -1 & 2 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 10 \\ 8 \\ 3 \\ 7 \end{bmatrix}$$

Recall $C = A^{-1} \cdot B$

$$\text{where } C = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix}$$

$$\text{From using mathLAB } C = \begin{bmatrix} 4 \\ 2 \\ -3 \\ 4 \end{bmatrix}$$

② model equation of a system $y = \sin(0.25t) + 2e^{-0.86t} - 2 \cos^2 t$

$0 \leq t \leq 10 \text{ hr}$, with $\Delta t = 0.1 \text{ hr}$

when $t = 0 \text{ hr}$

when $y = 0.86$

when $t = 0.2 \text{ hr}$

(1) $y = 0.70$

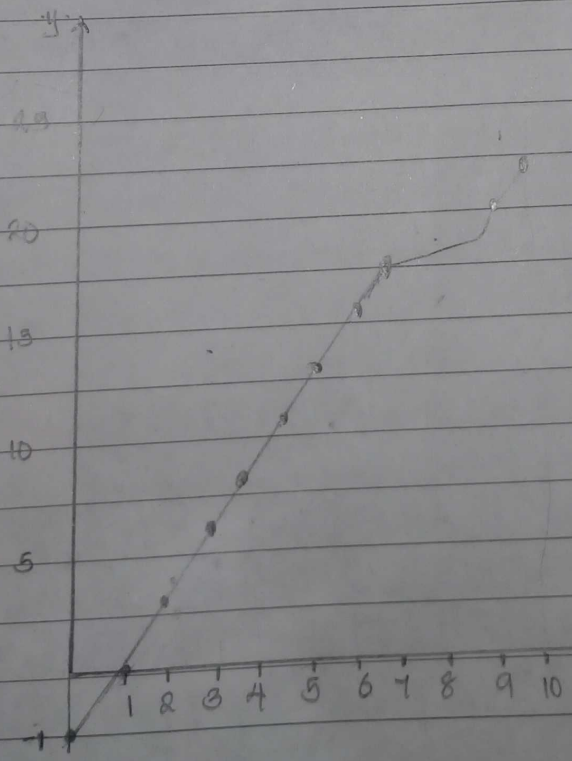
(1) $t = 0.3 \text{ hr}$

$y = 0.54$

$t = 0 \text{ hr}$

$y = 22.59$

t	y	t	y	t	y	t	y
A-8	10.4226	6.4	10.6555	8.0	18.5384	9.6	21860
A-9	10.6935	6.5	14.9109	8.1	18.7526	9.7	22.0482
S-0	10.9632	6.6	15.1640	8.2	18.9110	9.8	22.2241
S-1	11.2329	6.7	15.4160	8.3	19.1474	9.9	22.4125
S-2	11.5012	6.8	15.6664	8.4	19.4166	100	22.5957
S-3	11.7692	6.9	15.9151	8.5	19.6331		
S-4	12.0369	7.0	16.1622	8.6	19.8472		
S-5	12.3031	7.1	16.4074	8.7	20.0591		
S-6	12.5622	7.2	16.6509	8.8	20.2696		
S-7	12.8338	7.3	16.8929	8.9	20.4901		
S-8	13.0973	7.4	17.1322	9.0	20.7158		
S-9	13.3600	7.5	17.3700	9.1	20.9333		
S-0	13.6216	7.6	17.6055	9.2	21.1433		
S-1	13.8820	7.7	17.8396	9.3	21.3410		
S-2	14.1412	7.8	18.0713	9.4	21.5164		
S-3	14.3990	7.9	18.3009	9.5	21.6694		



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

$$A = \begin{bmatrix} 1 & -2 & -1 & 3 \\ 2 & 3 & 0 & 1 \\ 1 & 0 & -4 & -2 \\ 0 & -1 & 3 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 10 \\ 8 \\ 3 \\ -7 \end{bmatrix}$$

$$C = A^{-1}B = \begin{bmatrix} 1 \\ 2 \\ -3 \\ 4 \end{bmatrix}$$

x	t	y	t	y	t	y	t	y
0	0	-1.0000	1.2	1.1966	2.4	4.0867	3.6	7.1787
0.1	0.1	-0.8555	1.3	1.4150	2.9	4.2903	3.1	7.4414
0.2	0.2	-0.7024	1.4	1.6375	2.6	4.5458	3.8	7.7167
0.3	0.3	-0.5513	1.9	1.8637	2.1	4.8030	3.9	7.9866
0.4	0.4	-0.3726	1.6	2.0939	2.8	5.0617	4.0	8.2568
0.5	0.5	-0.1969	1.7	2.3266	2.9	5.3223	4.1	8.5274
0.6	0.6	-0.0146	1.8	2.5628	3.0	5.5841	4.2	8.7980
0.7	0.7	0.1738	1.9	2.804	3.1	5.8473	4.3	9.0692
0.8	0.8	0.3681	2.0	3.0444	3.2	6.1116	4.4	9.3402
0.9	0.9	0.5679	2.1	3.2887	3.3	6.3720	4.5	9.6112
1.0	1.0	0.7727	2.2	3.5398	3.4	6.6453	4.6	9.8821
1.1	1.1	0.9824	2.3	3.7882	3.5	6.9106	4.7	10.1529