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mat NO 16/ENGG01/020

Dept Chemical Engineering

Assignment 3

ENGG 38

$$\bar{T}_1 + \bar{T}_2 - 2\bar{T}_3 + \bar{T}_4 + 3\bar{T}_5 - \bar{T}_6 = 4$$

$$2\bar{T}_1 - \bar{T}_2 + \bar{T}_3 + 2\bar{T}_4 + \bar{T}_5 - 3\bar{T}_6 = 20$$

$$\bar{T}_1 + 3\bar{T}_2 - 3\bar{T}_3 - \bar{T}_4 + 2\bar{T}_5 + \bar{T}_6 = -15$$

$$5\bar{T}_1 + 2\bar{T}_2 - \bar{T}_3 - \bar{T}_4 + 2\bar{T}_5 + \bar{T}_6 = -3$$

$$-3\bar{T}_1 - \bar{T}_2 + 2\bar{T}_3 + 3\bar{T}_4 + \bar{T}_5 + 3\bar{T}_6 = 16$$

$$4\bar{T}_1 + 3\bar{T}_2 + \bar{T}_3 - 6\bar{T}_4 - 3\bar{T}_5 - 2\bar{T}_6 = -27$$

1	1	-2	1	3	-1	\bar{T}_1	40
2	-1	1	2	1	-3	\bar{T}_2	20
1	3	-3	-1	2	+1	\bar{T}_3	-15
5	2	-1	-1	2	+1	\bar{T}_4	-3
-3	-1	2	3	-1	+3	\bar{T}_5	16
4	3	1	-6	-3	-2	\bar{T}_6	-27

1	1	-2	1	3	-1	4
$2 - (\frac{3}{1}x_1)$	$-1 - (\frac{2}{1}x_1)$	$1 - (\frac{2}{1}x_1 - 2)$	$2 - (\frac{2}{1}x_1)$	$1 - (\frac{2}{1}x_3)$	$-3 - (\frac{2}{1}x_1 - 1)$	$20 - (\frac{2}{1}x_4)$
$1 - (\frac{1}{1}x_1)$	$3 - (\frac{3}{1}x_1)$	$-3 - (\frac{1}{1}x_1 - 2)$	$-1 - (\frac{1}{1}x_1)$	$2 - (\frac{1}{1}x_3)$	$1 - (\frac{1}{1}x_1 - 1)$	$-15 - (\frac{1}{1}x_4)$
$5 - (\frac{5}{1}x_1)$	$2 - (\frac{5}{1}x_1)$	$-1 - (\frac{5}{1}x_1 - 2)$	$-1 - (\frac{5}{1}x_1)$	$2 - (\frac{5}{1}x_3)$	$1 - (\frac{5}{1}x_1 - 1)$	$-3 - (\frac{5}{1}x_4)$
$-3 - (\frac{-3}{1}x_1)$	$-1 - (\frac{3}{1}x_1)$	$2 - (\frac{-3}{1}x_1 - 2)$	$3 - (\frac{-3}{1}x_1)$	$1 - (\frac{-3}{1}x_3)$	$3 - (\frac{-3}{1}x_1 - 1)$	$16 - (\frac{-3}{1}x_4)$
$4 - (\frac{4}{1}x_1)$	$3 - (\frac{4}{1}x_1)$	$1 - (\frac{4}{1}x_1 - 2)$	$-6 - (\frac{4}{1}x_1)$	$3 - (\frac{4}{1}x_3)$	$-2 - (\frac{4}{1}x_1 - 1)$	$-27 - (\frac{4}{1}x_4)$

1	1	-2	1	3	-1	4
0	-3	5	0	-5	-1	12
0	2	-1	-2	-1	2	-19
0	-3	9	-6	-13	6	-23
0	2	-4	6	10	0	28
0	-1	9	-10	-15	2	-43

1	1	-2	1	3	-1	4
0	-3	5	0	-5	-1	12
0	$2 - (\frac{2}{3}x-3)$	$-1(-\frac{2}{3}x+5)$	$2 - (\frac{2}{3}x+0)$	$-1(-\frac{2}{3}x+5)$	$2 - (\frac{2}{3}x-1)$	$-19 - (\frac{2}{3}x+12)$
0	$-3 - (\frac{3}{3}x-3)$	$9 - (\frac{3}{3}x+5)$	$-6 - (\frac{3}{3}x+0)$	$-13 (\frac{3}{3}x+5)$	$6 - (\frac{3}{3}x-1)$	$-23 - (\frac{3}{3}x+12)$
0	$2 - (\frac{2}{3}x-3)$	$-4 - (\frac{2}{3}x+5)$	$6 - (\frac{2}{3}x+0)$	$-10 (\frac{2}{3}x+5)$	$0 - (\frac{2}{3}x-1)$	$25 - (\frac{2}{3}x+12)$
0	$-1(-\frac{1}{3}x-3)$	$9 - (\frac{1}{3}x+5)$	$-10(-\frac{1}{3}x+0)$	$-15 - (\frac{1}{3}x+5)$	$0 - (\frac{1}{3}-1)$	$-43 - (\frac{1}{3}x+2)$

1	1	-2	1	3	-1	4
0	-3	5	0	-5	-1	12
0	0	$\frac{7}{3}$	-2	$-\frac{13}{3}$	$\frac{4}{3}$	-11
0	0	4	-6	-8	7	-35
0	0	$-\frac{2}{3}$	6	$\frac{20}{3}$	$-\frac{2}{3}$	36
0	0	$\frac{22}{3}$	-10	$-\frac{40}{3}$	$\frac{7}{3}$	-47

1	1	-2	1	3	-1	4
0	-3	5	0	-5	-1	12
0	0	$\frac{7}{3}$	-2	$-\frac{13}{3}$	$\frac{4}{3}$	-11
0	0	$4 - (\frac{12}{7}x + \frac{7}{3})$	$-6 - (\frac{12}{7}x + 2)$	$-8 - (\frac{12}{7}x - \frac{11}{3})$	$7 - (\frac{12}{7}x + \frac{4}{3})$	$-35 - (\frac{12}{7}x - 11)$
0	0	$-\frac{2}{3} - (\frac{6-6}{21}x + \frac{7}{3})$	$6 - (\frac{5}{21}x + 2)$	$\frac{20}{3} - (\frac{6-6}{21}x + \frac{11}{3})$	$-\frac{2}{3} - (\frac{6-6}{21}x + \frac{4}{3})$	$36 - (\frac{6-6}{21}x - 11)$
0	0	$\frac{22}{3} - (\frac{22}{7}x + \frac{7}{3})$	$-10 - (\frac{22}{7}x + 2)$	$-\frac{40}{3} - (\frac{22}{7}x - \frac{11}{3})$	$\frac{7}{3} - (\frac{22}{7}x + \frac{4}{3})$	$37 - (\frac{22}{7}x - 11)$

1	1	-3	1	3	-1	4
0	-3	5	0	-5	-1	12
0	0	$\frac{7}{3}$	-2	$-\frac{13}{3}$	$\frac{4}{3}$	-11
0	0	0	$-\frac{15}{7}$	$-\frac{4}{7}$	$\frac{33}{7}$	$-\frac{113}{7}$
0	0	0	$\frac{38}{7}$	$\frac{38}{7}$	$-\frac{2}{7}$	$+\frac{230}{7}$
0	0	0	$-\frac{26}{7}$	$\frac{2}{7}$	$-\frac{13}{7}$	$-\frac{87}{7}$

1	-1	-3	1	3	-1	4
0	-3	5	0	-5	-1	12
0	0	$\frac{7}{3}$	-3	$-\frac{13}{3}$	$\frac{4}{3}$	-11
0	0	0	$-\frac{4}{7}$	$-\frac{4}{7}$	$\frac{33}{7}$	$-\frac{133}{7}$
0	0	0	$\frac{38}{7} - (\frac{-38}{18}x - \frac{18}{7})$	$\frac{38}{7} - (\frac{-38}{18}x - \frac{4}{7})$	$-\frac{2}{7} - (\frac{-38}{18}x + \frac{23}{7})$	$-\frac{1230}{7} - (\frac{-38}{18}x - \frac{113}{7})$
0	0	0	$-\frac{26}{7} - (\frac{26}{18}x - \frac{18}{7})$	$\frac{2}{7} - (\frac{26}{18}x - \frac{4}{7})$	$-\frac{13}{7} - (\frac{26}{18}x + \frac{33}{7})$	$-\frac{87}{7} - (\frac{26}{18}x - \frac{113}{7})$

1	1	-2	1	3	-1	4
0	-3	5	0	5	-1	12
0	0	7/3	-2	-13/3	4/3	-11
0	0	0	18/7	4/7	33/7	-113/7
0	0	0	0	38/9	29/3	-11/9
0	0	0	0	10/9	-26/3	98/9

1	1	-2	1	3	-1	4
0	-3	5	0	5	-1	12
0	0	7/3	-2	-13/3	4/3	-11
0	0	0	18/7	4/7	33/7	-113/9
0	0	0	0	38/9	29/3	-11/9
0	0	0	0	10/9 - (5/19 * 35/9)	-36/3 - (5/19 * 29/3)	98/9 - (5/19 * -11/9)

1	1	2	1	3	-1	4
0	-3	5	0	5	-1	12
0	0	7/3	-2	-13/3	4/3	-11
0	0	0	18/7	4/7	33/7	-113/7
0	0	0	0	38/9	-29/3	-11/9
0	0	0	0	0	-213/19	213/19

1	1	2	1	3	-1	T ₁	4	-4
0	-3	5	0	5	-1	T ₂	20	12
0	0	7/3	-2	-13/3	4/3	T ₃	-11	-11
0	0	0	18/7	4/7	33/7	T ₄	-113/7	-113/7
0	0	0	0	38/9	29/3	T ₅	-11/9	-11/9
0	0	0	0	0	-213/19	T ₆	-213/19	213/19

- $1x_{\bar{1}} + 1x_{\bar{2}} + 2x_{\bar{3}} + 1x_{\bar{4}} + 3x_{\bar{5}} + -1x_{\bar{6}} \quad 4$
- $0x_{\bar{1}} + -3x_{\bar{2}} + 5x_{\bar{3}} + 0x_{\bar{4}} + 5x_{\bar{5}} + -1x_{\bar{6}} \quad 12$
- $0x_{\bar{1}} + 0x_{\bar{2}} + 7/3x_{\bar{3}} + -2x_{\bar{4}} + -13/3x_{\bar{5}} + 4/3x_{\bar{6}} \quad -11$
- $0x_{\bar{1}} + 0x_{\bar{2}} + 0x_{\bar{3}} + 18/7x_{\bar{4}} + 4/7x_{\bar{5}} + 33/7x_{\bar{6}} \quad -113/7$
- $0x_{\bar{1}} + 0x_{\bar{2}} + 0x_{\bar{3}} + 0x_{\bar{4}} + 38/9x_{\bar{5}} + 29/3x_{\bar{6}} \quad -11/9$
- $0x_{\bar{1}} + 0x_{\bar{2}} + 0x_{\bar{3}} + 0x_{\bar{4}} + 0x_{\bar{5}} + -213/19x_{\bar{6}} \quad 213/19$

```
Editor - C:\Users\tomisin\Documents\MATLAB\ass3.m
INTERPOLATION.m x linear.m x Untitled.m x Ass1.m x ass3.m x ass2.m x +
1 - commandwindow
2 - clear
3 - clc
4 - format short g
5 - A=[1 1 -2 1 3 -1 ;2 -1 1 2 1 -3 ;1 3 -3 -1 2 1 ;5 2 -1 -1 2 1 ;-3 -1 2 3 1 3 ;4 3 1 -6 -3 -2];
6 - b=[4; 20; -15; -3; 16; -27];
7 - Aug= [A,b];
8 - [m,n]= size(Aug);
9 - for k = 1:n-1
10 -     for i = k+1 :n-1
11 -         if Aug(i,k)~= 0
12 -             q = Aug(i,k)/Aug(k,k);
13 -             Aug(i,k:n) = Aug(i,k:n) - q*Aug(k,k:n)
14 -         end
15 -     end
16 - end
17 - X = zeros(m,1)
```

MATLAB

Editor - C:\Users\tomisin\Documents\MATLAB\ass3.m

INTERPOLATION.m x linear.m x Untitled.m x Ass1.m x ass3.m x ass2.m x +

```

6 - b=[4; 20; -15; -3; 16; -27];
7 - Aug= [A,b];
8 - [m,n]= size(Aug);
9 - for k = 1:n-1
10 -     for i = k+1 :n-1
11 -         if Aug(i,k)~= 0
12 -             q = Aug(i,k)/Aug(k,k);
13 -             Aug(i,k:n) = Aug(i,k:n) - q*Aug(k,k:n)
14 -         end
15 -     end
16 - end
17 - X = zeros(m,1)
18 - X(m) = Aug(m,n)/Aug(m,m)
19 - for k = m-1:-1:1
20 -     X(k) = (Aug(k,n) - (Aug(k,k+1:m)*X(k+1:m)/Aug(k,k)))
21 - end
22 - x=X

```

Command Window

New to MATLAB? See resources for [Getting Started](#).

```

Aug =
     1     1    -2     1     3    -1     4
     0    -3     5     0    -5    -1    12
     1     3    -3    -1     2     1   -15
     5     2    -1    -1     2     1    -3

```

script Ln