

Ans 3

$$T_1 + T_2 - 2T_3 + T_4 + 3T_5 - T_6 = 4$$

$$2T_1 - T_2 + T_3 + 2T_4 + T_5 - 3T_6 = 20$$

$$T_1 + 3T_2 - 3T_3 - T_4 + 2T_5 + T_6 = -15$$

$$5T_1 + 2T_2 - T_3 - T_4 + 2T_5 + T_6 = -3$$

$$-3T_1 - T_2 + 2T_3 + 3T_4 + T_5 + 3T_6 = 16$$

$$4T_1 + 3T_2 + T_3 - 6T_4 - 3T_5 - 2T_6 = -27$$

Soln

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 2 & -1 & 1 & 2 & 1 & -3 \\ 1 & 3 & -3 & -1 & 2 & 1 \\ 5 & 2 & -1 & -1 & 2 & 1 \\ -3 & -1 & 2 & 3 & 1 & 3 \\ 4 & 3 & 1 & 6 & -3 & -2 \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 20 \\ -15 \\ -3 \\ 16 \\ -27 \end{bmatrix}$$

$$T_1 = 2$$

$$T_2 = 1$$

$$T_3 = 5$$

$$T_4 = -3$$

$$T_5 = 4$$

1	1	-2	1	3	1	$\begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix}$
$2-2C(1)$	$-1-2C(1)$	$1-2C(-2)$	$2-2C(1)$	$1-2C(3)$	$-3-2C(-1)$	
$1-1C(1)$	$3-1C(1)$	$-3-1C(-2)$	$-1-1C(1)$	$2-1C(3)$	$1-1C(-1)$	
$5-5C(1)$	$2-5C(1)$	$-1-5C(-2)$	$-1-5C(1)$	$2-5C(3)$	$1-5C(-1)$	
$-3+3C(1)$	$-1+3C(1)$	$2+3C(-2)$	$3+3C(1)$	$1+3C(3)$	$3+3C(-1)$	
$4-4C(1)$	$3-4C(1)$	$1-4C(-2)$	$-6-4C(1)$	$-3-4C(3)$	$-2-4C(-1)$	

$$\begin{bmatrix} 4 \\ 20-2C(4) \\ -15-1C(4) \\ -3-5C(4) \\ 16+5C(4) \\ -27-4C(4) \end{bmatrix}$$

1	1	-2	1	3	-1	$\begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix}$	4
0	-3	5	6	-5	-1		12
0	2	-1	-2	-1	2		-19
6	-3	9	-6	-13	6		-25
0	2	-4	6	10	0		28
0	-1	9	10	-15	2		43

$$F_1 = -\frac{2}{3}$$

$$F_2 = -1$$

$$F_3 = -\frac{2}{3}$$

$$F_4 = \frac{4}{3}$$

1	2	-2	1	3	-1	$\begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix}$	4
0	-3	5	0	-5	-1		12
0	$2+\frac{4}{3}C(-3)$	$-1+\frac{4}{3}C(5)$	$-2+\frac{4}{3}C(0)$	$-1+\frac{4}{3}C(-5)$	$2+\frac{4}{3}C(-1)$		$-11+\frac{4}{3}C(12)$
6	$-3-1C(-3)$	$9-1C(5)$	$-6-1C(0)$	$-13-1C(-5)$	$6-1C(-1)$		$-25-1C(12)$
0	$2+\frac{4}{3}C(-3)$	$4+\frac{4}{3}C(5)$	$6+\frac{4}{3}C(0)$	$10+\frac{4}{3}C(-5)$	$0+\frac{4}{3}C(-1)$		$28+\frac{4}{3}C(12)$
6	$-1-\frac{4}{3}C(-3)$	$9-\frac{4}{3}C(5)$	$-10+\frac{4}{3}C(0)$	$-5-\frac{4}{3}C(-5)$	$2-\frac{4}{3}C(-1)$		$-45-\frac{4}{3}C(12)$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 4 & -6 & -8 & 2 \\ 0 & 0 & -\frac{2}{3} & -6 & \frac{20}{3} & -\frac{4}{3} \\ 0 & 0 & \frac{22}{3} & -10 & -\frac{40}{3} & \frac{11}{3} \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -35 \\ 36 \\ 49 \end{bmatrix}$$

$$T_1 = \frac{12}{7}$$

$$T_2 = \frac{2}{7}$$

$$T_3 = \frac{22}{7}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 4 - \frac{12}{7}(\frac{7}{3}) & -6 - \frac{12}{7}(-2) & -8 - \frac{12}{7}(-\frac{13}{3}) & 2 - \frac{12}{7}(\frac{4}{3}) \\ 0 & 0 & -\frac{2}{3} + \frac{22}{7}(\frac{7}{3}) & -6 + \frac{22}{7}(-2) & \frac{20}{3} + \frac{22}{7}(-\frac{13}{3}) & -\frac{4}{3} + \frac{22}{7}(\frac{4}{3}) \\ 0 & 0 & \frac{22}{3} - \frac{22}{7}(\frac{7}{3}) & -10 - \frac{22}{7}(-2) & -\frac{40}{3} - \frac{22}{7}(-\frac{13}{3}) & \frac{11}{3} - \frac{22}{7}(\frac{4}{3}) \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix}$$

$$= \begin{bmatrix} 4 \\ 12 \\ -11 \\ -35 - \frac{12}{7}(-11) \\ 36 + \frac{126}{7}(-11) \\ -47 - \frac{12}{7}(-11) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{16}{7} & -\frac{4}{7} & \frac{38}{7} \\ 0 & 0 & 0 & \frac{38}{7} & \frac{38}{7} & -\frac{2}{7} \\ 0 & 0 & 0 & -\frac{26}{7} & \frac{2}{7} & -\frac{13}{7} \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{113}{7} \\ \frac{230}{7} \\ -\frac{87}{9} \end{bmatrix}$$

$$T_2 = \frac{-19}{7}, T_3 = \frac{13}{4}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 \\ 0 & 0 & 0 & \frac{38}{7} + \frac{19}{9} \left( \frac{18}{7} \right) & -\frac{34}{7} + \frac{19}{9} \left( -\frac{4}{7} \right) & -\frac{2}{7} - \frac{19}{9} \left( \frac{33}{7} \right) \\ 0 & 0 & 0 & 0 & -\frac{26}{7} - \frac{13}{9} \left( -\frac{18}{7} \right) & \frac{2}{7} - \frac{13}{9} \left( -\frac{4}{7} \right) \\ 0 & 0 & 0 & 0 & -\frac{12}{7} - \frac{13}{9} \left( \frac{33}{7} \right) & \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -113/7 \\ -11/9 \\ -37/9 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 \\ 0 & 0 & 0 & 0 & 38/9 & 39/3 \\ 0 & 0 & 0 & 0 & 18/9 & -26/3 \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -113/7 \\ -11/9 \\ 18/9 \end{bmatrix}$$

$$f_1 = \frac{8}{19}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 \\ 0 & 0 & 0 & 0 & 38/9 & 29/3 \\ 0 & 0 & 0 & 0 & 18/9 - \frac{5}{19} \left( \frac{38}{9} \right) & -\frac{26}{3} - \frac{5}{9} \left( \frac{29}{3} \right) \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -13 \\ -113/7 \\ -11/9 \\ \frac{45}{9} - \frac{5}{19} \left( -\frac{11}{9} \right) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 \\ 0 & 0 & 0 & 0 & 8/9 & 29/3 \\ 0 & 0 & 0 & 0 & 0 & -213/19 \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -113/7 \\ -11/9 \\ 213/19 \end{bmatrix}$$

$$\frac{-213}{19} T_6 = \frac{213}{14}$$

$$T_6 = \frac{213}{19} \times \frac{-19}{213} = -1$$

$$\frac{38}{9} T_5 + \frac{29}{3} T_6 = \frac{-11}{9}$$

$$T_5 = \left( \frac{-11}{9} + \frac{29}{3} \right) \times \frac{9}{38} = 2$$

$$T_4 = \left( \frac{-113}{7} + \frac{8}{7} + \frac{33}{7} \right) \times \frac{-7}{18} = 4$$

$$T_3 = \left( -11 + 8 + \frac{26}{3} + \frac{4}{3} \right) \times \frac{3}{7} = 3$$

$$T_2 = \frac{12 - 15 + 10 - 1}{-3} = -2$$

$$T_1 = 4 + 2 + 6 - 4 - 6 - 1 = 1$$

$$\therefore T_1 = 1, T_2 = -2, T_3 = 3$$

$$T_4 = 4, T_5 = 2, T_6 = -1$$