

$$T_1 + T_2 - 2T_3 + T_4 + 5T_5 - T_6 = 4$$

$$2T_1 - T_2 + T_3 + 2T_4 + T_5 - 5T_6 = 20$$

$$T_1 + 3T_2 - 8T_3 - T_4 + 2T_5 + T_6 = -15$$

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

$$-3T_1 - T_2 + 8T_3 + 5T_4 + T_5 + 5T_6 = 16$$

$$4T_1 + 8T_2 + T_3 - 6T_4 - 5T_5 - 2T_6 = -27$$

Soln

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 5 & -1 \\ 2 & -1 & 1 & 2 & 1 & -5 \\ 1 & 3 & -8 & -1 & 2 & 1 \\ 5 & 2 & -1 & -1 & 2 & 1 \\ -3 & -1 & 8 & 5 & 1 & 5 \\ 4 & 8 & 1 & -6 & -5 & -2 \end{bmatrix} \begin{matrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{matrix} = \begin{matrix} 4 \\ 20 \\ -15 \\ -3 \\ 16 \\ -27 \end{matrix}$$

$$T_1 = 2$$

$$T_2 = 1$$

$$T_3 = 5$$

$$T_4 = -3$$

		-2		3		T_1
$2-2(1)$	$-1-2(1)$	$1-2(-2)$	$2-2(1)$	$1-2(3)$	$-3-2(-1)$	T_2
$1-1(1)$	$5-1(1)$	$-3-1(-2)$	$-1-1(1)$	$2-1(3)$	$1-1(-1)$	T_3
$5-5(1)$	$2-5(1)$	$-1-5(-2)$	$-1-5(1)$	$2-5(3)$	$1-5(-1)$	T_4
$-3+5(1)$	$-1+5(1)$	$2+5(-2)$	$3+5(1)$	$1+5(3)$	$3+5(-1)$	T_5
$4-4(1)$	$5-4(1)$	$1-4(-2)$	$-6-4(1)$	$-3-4(3)$	$-2-4(-1)$	T_6

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

1	1	-2	1	3	-1	T_1	4
0	-3	5	6	-5	-1	T_2	12
0	2	-1	-2	-1	2	T_3	-11
0	-5	9	-6	-3	6	T_4	-25
0	2	-4	6	10	0	T_5	28
0	-1	7	10	-15	2	T_6	45

$F_1 = \frac{4}{5}$
 $F_2 = -1$
 $F_3 = -\frac{11}{5}$
 $F_4 = \frac{1}{5}$

1	2	-2	1	3	-1	T_1	4
0	-3	5	6	-5	-1	T_2	12
0	$2+\frac{1}{5}(-5)$	$-1+\frac{1}{5}(5)$	$-2+\frac{1}{5}(10)$	$-1+\frac{1}{5}(15)$	$2+\frac{1}{5}(-1)$	T_3	$-11+\frac{1}{5}(45)$
0	$-3-1(-5)$	$9-1(5)$	$-6-1(10)$	$-3-1(15)$	$6-1(-1)$	T_4	$-25-1(12)$
0	$2+\frac{1}{5}(-5)$	$4+\frac{1}{5}(5)$	$6+\frac{1}{5}(10)$	$10+\frac{1}{5}(15)$	$0+\frac{1}{5}(-1)$	T_5	$28+\frac{1}{5}(45)$
0	$-1-\frac{1}{5}(-5)$	$7-\frac{1}{5}(5)$	$-10+\frac{1}{5}(10)$	$-15+\frac{1}{5}(15)$	$2-\frac{1}{5}(-1)$	T_6	$-45-\frac{1}{5}(45)$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{13}{7} & -\frac{4}{7} & \frac{33}{7} \\ 0 & 0 & 0 & \frac{58}{7} + \frac{13}{9} \left(\frac{18}{7}\right) & -\frac{34}{7} + \frac{13}{9} \left(-\frac{4}{7}\right) & -\frac{2}{7} - \frac{13}{9} \left(\frac{33}{9}\right) \\ 0 & 0 & 0 & 0 - \frac{24}{7} - \frac{13}{9} \left(-\frac{18}{7}\right) & \frac{2}{7} - \frac{13}{9} \left(-\frac{4}{7}\right) & \frac{12}{7} - \frac{13}{9} \left(\frac{33}{7}\right) \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{13}{7} \\ -\frac{13}{9} \\ -\frac{34}{7} - \frac{13}{9} \left(-\frac{4}{7}\right) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{13}{7} & -\frac{4}{7} & \frac{33}{7} \\ 0 & 0 & 0 & 0 & \frac{35}{9} & \frac{29}{3} \\ 0 & 0 & 0 & 0 & \frac{18}{9} & \frac{2}{3} \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{13}{7} \\ -\frac{13}{9} \\ \frac{10}{9} \end{bmatrix}$$

$$F_1 = \frac{5}{9}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{13}{7} & -\frac{4}{7} & \frac{33}{7} \\ 0 & 0 & 0 & 0 & \frac{35}{9} & \frac{29}{3} \\ 0 & 0 & 0 & 0 & \frac{18}{9} - \frac{5}{19} \left(\frac{38}{9}\right) & -\frac{26}{3} - \frac{5}{9} \left(\frac{29}{3}\right) \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{13}{7} \\ -\frac{13}{9} \\ \frac{45}{9} - \frac{5}{19} \left(-\frac{4}{9}\right) \end{bmatrix}$$

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

$$\begin{bmatrix} 0 & -3 & 5 & 0 & -3 & -1 \\ 0 & 0 & \frac{1}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 4 & -6 & -8 & 2 \\ 0 & 0 & -\frac{2}{3} & -6 & \frac{20}{3} & -\frac{7}{3} \\ 0 & 0 & \frac{22}{3} & -10 & -\frac{40}{3} & \frac{13}{3} \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 12 \\ -11 \\ -35 \\ 36 \\ -47 \end{bmatrix}$$

$$f_1 = \frac{12}{7}$$

$$f_2 = \frac{7}{7}$$

$$f_3 = \frac{22}{7}$$

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

$$= \begin{bmatrix} 4 \\ 12 \\ -11 \\ -35 - \frac{12}{7}(-11) \\ 36 + \frac{122}{7}(-11) \\ -47 - \frac{12}{7}(-11) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{1}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{18}{7} & -\frac{4}{7} & \frac{32}{7} \\ 0 & 0 & 0 & \frac{38}{7} & \frac{38}{7} & -\frac{7}{7} \\ 0 & 0 & 0 & -\frac{26}{7} & \frac{7}{7} & -\frac{13}{7} \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{113}{7} \\ \frac{230}{7} \\ -\frac{87}{7} \end{bmatrix}$$

$$f_1 = \frac{-19}{7}, f_2 = \frac{13}{4}$$

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

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

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

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

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

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

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

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

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

$$T_4 = -4, \quad T_5 = 2, \quad T_6 = -1.$$