

Ass 3

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

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

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

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

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

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

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

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

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

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

$$T_2 = -1$$

$$F_3 = -\frac{7}{3}$$

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

$$\begin{bmatrix} 1 & 2 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 6 & -5 & -1 \\ 0 & 2+\frac{7}{3}C(3) & -1+\frac{7}{3}C(5) & -2+\frac{7}{3}C(6) & -1+\frac{7}{3}C(-5) & 2+\frac{7}{3}C(-1) \\ 6 & -3-1C(3) & 9-1C(5) & -6-1C(6) & -13-1C(-5) & 6-1C(-1) \\ 0 & 2+\frac{4}{3}C(3) & 4+\frac{4}{3}C(5) & 6+\frac{4}{3}C(6) & 10+\frac{4}{3}C(-5) & 0+\frac{4}{3}C(-1) \\ 0 & -1-\frac{1}{3}C(3) & 9-\frac{1}{3}C(5) & -10+\frac{1}{3}C(6) & -15-\frac{1}{3}C(-5) & 2-\frac{1}{3}C(-1) \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} \begin{bmatrix} 4 \\ 12 \\ -11+\frac{7}{3}C(12) \\ -25-1C(12) \\ 28+\frac{7}{3}C(12) \\ -45-\frac{1}{3}C(12) \end{bmatrix}$$

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

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

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

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

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

$$= \begin{bmatrix} 4 \\ 12 \\ -11 \\ -35 - \frac{12}{7}(-11) \\ 36 + \frac{128}{7}(-11) \\ -47 - \frac{12}{7}(-11) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{16}{7} & -\frac{4}{7} & \frac{32}{7} \\ 0 & 0 & 0 & \frac{38}{7} & \frac{38}{7} & -\frac{2}{7} \\ 0 & 0 & 0 & -\frac{26}{7} & \frac{2}{7} & -\frac{13}{7} \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{113}{7} \\ \frac{230}{7} \\ -\frac{87}{7} \end{bmatrix}$$

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

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{18}{7} & -\frac{4}{7} & \frac{33}{7} \\ 0 & 0 & 0 & \frac{38}{7} + \frac{19}{9} \left( \frac{18}{7} \right) & -\frac{34}{7} + \frac{19}{9} \left( -\frac{4}{7} \right) & -\frac{2}{7} - \frac{19}{9} \left( \frac{33}{7} \right) \\ 0 & 0 & 0 & 0 & -\frac{24}{7} - \frac{13}{9} \left( -\frac{18}{7} \right) & \frac{2}{7} - \frac{13}{9} \left( -\frac{4}{7} \right) \\ 0 & 0 & 0 & 0 & -\frac{12}{7} - \frac{13}{9} \left( \frac{33}{7} \right) \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{113}{7} \\ -\frac{22019}{7} \left( -\frac{13}{9} \right) \\ -\frac{37}{7} \left( -\frac{13}{9} \right) \end{bmatrix}$$

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

$$T_1 = \frac{8}{19}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{18}{7} & -\frac{4}{7} & \frac{33}{7} \\ 0 & 0 & 0 & 0 & \frac{38}{9} & \frac{29}{3} \\ 0 & 0 & 0 & 0 & \frac{18}{9} - \frac{5}{19} \left( \frac{38}{9} \right) & -\frac{26}{3} - \frac{5}{9} \left( \frac{29}{3} \right) \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -13 \\ -\frac{113}{7} \\ -\frac{11}{9} \\ \frac{48}{9} - \frac{5}{19} \left( -\frac{14}{9} \right) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{18}{7} & -\frac{4}{7} & \frac{33}{7} \\ 0 & 0 & 0 & 0 & \frac{8}{9} & \frac{29}{3} \\ 0 & 0 & 0 & 0 & 0 & -\frac{2}{14} \end{bmatrix} \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{113}{7} \\ -\frac{11}{9} \\ \frac{213}{19} \end{bmatrix}$$

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

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

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

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

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

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

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

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

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

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