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Computer Engineering

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

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

$$-3T_1 = T_2 + 3T_3 + 5T_4 + T_5 + 2T_6 = 16$$

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

So the system

1	1	-3	1	3	-1	T_1	9
2	-1	1	2	1	-3	T_2	20
3	3	-3	-1	2	1	T_3	-15
4	2	-1	-1	2	1	T_4	-3
-3	-1	2	3	1	5	T_5	16
4	3	1	6	-3	-2	T_6	-27

$$T_1 = 2$$

$$T_2 = 1$$

$$T_3 = 5$$

$$T_4 = -3$$

$$T_5 = 4$$

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

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

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 2 & -1 & -2 & -1 & 2 \\ 0 & -3 & 9 & -6 & -13 & 6 \\ 0 & 2 & -4 & 6 & 10 & 0 \\ 0 & -1 & 9 & 10 & -15 & 2 \end{bmatrix} \begin{matrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{matrix} = \begin{bmatrix} 4 \\ 12 \\ -19 \\ -23 \\ 28 \\ -43 \end{bmatrix}$$

$$F_1 = -2/3$$

$$F_2 = -1$$

$$F_3 = -2/3$$

$$F_4 = 1/3$$

$$\begin{bmatrix} 1 & 2 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 2 + \frac{2}{3}(-3) & -1 + \frac{2}{3}(5) & -2 + \frac{2}{3}(1) & -1 + \frac{2}{3}(-5) & 2 + \frac{2}{3}(-1) \\ 0 & -3 - 1(-3) & 9 - 1(5) & -6 - 1(1) & -13 - 1(-5) & 6 - 1(-1) \\ 0 & 2 + \frac{2}{3}(-3) & 4 + \frac{2}{3}(5) & 6 + \frac{2}{3}(1) & 10 + \frac{2}{3}(-5) & 0 + \frac{2}{3}(-1) \\ 0 & -1 - \frac{1}{3}(-3) & 9 - \frac{1}{3}(5) & -10 + \frac{1}{3}(1) & -15 - \frac{1}{3}(-5) & 2 - \frac{1}{3}(-1) \end{bmatrix} \begin{matrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{matrix} = \begin{bmatrix} 4 \\ 12 \\ -19T^{2/3}(12) \\ -23 - 1(12) \\ 28T^{2/3}(12) \\ -43 - 1/3(12) \end{bmatrix}$$

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

$F_1 = 1/7$
 $F_2 = -2/7$
 $F_3 = 22/7$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 \\ 0 & 0 & 4 - 7/7(7/3) & -6 - 12/7(-2) & -8 - 12/7(-13/3) & 7 - 12/7(4/3) \\ 0 & 0 & -2/3 + 7/7(7/3) & 6 + 7/7(-2) & 20/3 + 7/7(-13/3) & -2/3 + 7/7(4/3) \\ 0 & 0 & 22/3 - 22/7(7/3) & -10 - 22/7(-2) & -40/3 - 22/7(-13/3) & 7/3 - 22/7(4/3) \end{bmatrix}$$

$$\begin{bmatrix} T_1 & 4 \\ T_2 & 12 \\ T_3 & -11 \\ T_4 & -35 - 12/7 \\ T_5 & 36 + 7/7(-2) \\ T_6 & -42 - 22/7 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 \\ 0 & 0 & 0 & 38/7 & 36/7 & -2/7 \\ 0 & 0 & 0 & -26/7 & 2/7 & -13/7 \end{bmatrix} = \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -113/7 \\ 280/7 \\ -87/7 \end{bmatrix}$$

$F_1 = \frac{-17}{7}, F_2 = \frac{13}{9}$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 \\ 0 & 0 & 0 & 38/7 + 19/7(-18/7) & 38/7 + 19/7(-4/7) & -2/7 + 19/7(33/7) \\ 0 & 0 & 0 & -26/7 - 13/7(-18/7) & 2/7 - 13/7(-4/7) & -13/7 - 13/7(33/7) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & 7/3 & -2 & -13/3 & 4/3 \\ 0 & 0 & 0 & -18/7 & -4/7 & 33/7 \\ 0 & 0 & 0 & 0 & 38/9 & 29/3 \\ 0 & 0 & 0 & 0 & 10/9 & -26/3 \end{bmatrix} = \begin{bmatrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{bmatrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -113/7 \\ -11/9 \\ 98/9 \end{bmatrix}$$

$$F_1 = \frac{5}{19}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{18}{7} & -\frac{4}{7} & \frac{33}{7} \\ 0 & 0 & 0 & \odot & \frac{28}{9} & \frac{29}{3} \\ 0 & 0 & 0 & \odot & \left\{ \frac{10}{9} - \frac{5}{9} \left(\frac{35}{9} \right) \right\} & -\frac{24}{3} - \frac{5}{19} \left(\frac{29}{3} \right) \end{bmatrix} \begin{matrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{matrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{113}{7} \\ -\frac{11}{9} \\ \frac{98}{9} - \frac{5}{19} \left(-\frac{11}{9} \right) \end{bmatrix}$$

$$\begin{bmatrix} 1 & 1 & -2 & 1 & 3 & -1 \\ 0 & -3 & 5 & 0 & -5 & -1 \\ 0 & 0 & \frac{7}{3} & -2 & -\frac{13}{3} & \frac{4}{3} \\ 0 & 0 & 0 & -\frac{18}{7} & -\frac{4}{7} & \frac{33}{7} \\ 0 & 0 & 0 & 0 & \frac{38}{9} & \frac{29}{3} \\ 0 & 0 & 0 & 0 & 0 & -\frac{213}{19} \end{bmatrix} \begin{matrix} T_1 \\ T_2 \\ T_3 \\ T_4 \\ T_5 \\ T_6 \end{matrix} = \begin{bmatrix} 4 \\ 12 \\ -11 \\ -\frac{113}{7} \\ -\frac{11}{9} \\ \frac{213}{19} \end{bmatrix}$$

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

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

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

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

$$T_4 = \left(-\frac{113}{7} + \frac{8}{7} T_5 \right) \times \frac{-7}{18} = 4$$

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

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

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

$$\therefore T_1 = 1, T_2 = -2, T_3 = 3, T_4 = 4, T_5 = 2, T_6 = -1$$