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10i) Gauss elimination method

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

Row 1 is the pivot

- $T_1 + T_2 - 2T_3 + T_4 + 3T_5 - T_6 = 4$
- $\bullet \left(2 - \frac{2}{1} \times 1\right)T_1 + \left(-1 - \frac{2}{1} \times 1\right)T_2 + \left(1 - \frac{2}{1} \times -2\right)T_3 + \left(2 - \frac{2}{1} \times 1\right)T_4$
 $+ \left(1 - \frac{2}{1} \times 3\right)T_5 + \left(-3 - \frac{2}{1} \times -1\right)T_6 = \left(20 - \frac{2}{1} \times 4\right)$
- $\bullet \left(1 - \frac{1}{1} \times 1\right)T_1 + \left(3 - \frac{1}{1} \times 1\right)T_2 + \left(-3 - \frac{1}{1} \times -2\right)T_3$
 $+ \left(-1 - \frac{1}{1} \times 1\right)T_4 + \left(2 - \frac{1}{1} \times 3\right)T_5 + \left(1 - \frac{1}{1} \times -1\right)T_6 = \left(-15 - \frac{1}{1} \times 4\right)$
- $\bullet \left(5 - \frac{5}{1} \times 1\right)T_1 + \left(2 - \frac{5}{1} \times 1\right)T_2 + \left(-1 - \frac{5}{1} \times -2\right)T_3 + \left(-1 - \frac{5}{1} \times 1\right)T_4$
 $+ \left(2 - \frac{5}{1} \times 3\right)T_5 + \left(-1 - \frac{5}{1} \times -1\right)T_6 = \left(-3 - \frac{5}{1} \times 4\right)$
- $\bullet \left(-3 - \frac{-3}{1} \times 1\right)T_1 + \left(-1 - \frac{-3}{1} \times 1\right)T_2 + \left(2 - \frac{-3}{1} \times -2\right)T_3 + \left(3 - \frac{-3}{1} \times 1\right)T_4$
 $+ \left(1 - \frac{-3}{1} \times 3\right)T_5 + \left(1 - \frac{-3}{1} \times -1\right)T_6 = \left(16 - \frac{-3}{1} \times 4\right)$
- $\bullet \left(4 - \frac{4}{1} \times 1\right)T_1 + \left(3 - \frac{4}{1} \times 1\right)T_2 + \left(1 - \frac{4}{1} \times -2\right)T_3 + \left(-6 - \frac{4}{1} \times 1\right)T_4$
 $+ \left(-3 - \frac{4}{1} \times 3\right)T_5 + \left(-2 - \frac{4}{1} \times -1\right)T_6 = \left(-27 - \frac{4}{1} \times 4\right)$

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

Row 2 is the pivot

- $T_1 + T_2 - 2T_3 + T_4 + 3T_5 - T_6 = 4$
- $0 - 3T_2 + 5T_3 + 0T_4 - 5T_5 - T_6 = 12$
- $(2 - \frac{-2}{-3} \times 3)T_2 + (1 - \frac{-2}{-3} \times 5)T_3 + (2 - \frac{-2}{-3} \times 0)T_4 + (-1 - \frac{-2}{-3} \times -5)T_5 + (-1 - \frac{-2}{-3} \times -1)T_6 = (-19 - \frac{-2}{-3} \times 12)$
- $(-3 - \frac{-3}{-3} \times -3)T_2 + (9 - \frac{-3}{-3} \times 5)T_3 + (-6 - \frac{-3}{-3} \times 0)T_4 + (-13 - \frac{-3}{-3} \times -5)T_5 + (6 - \frac{-3}{-3} \times -1)T_6 = (-23 - \frac{-3}{-3} \times 12)$
- $(2 - \frac{-2}{-3} \times -3)T_2 + (-4 - \frac{-2}{-3} \times 5)T_3 + (6 - \frac{-2}{-3} \times 0)T_4 + (10 - \frac{-2}{-3} \times -5)T_5 + (0 - \frac{-2}{-3} \times -1)T_6 = (28 - \frac{-2}{-3} \times 12)$
- $(-1 - \frac{-1}{-3} \times -3)T_2 + (9 - \frac{-1}{-3} \times 5)T_3 + (-10 - \frac{-1}{-3} \times 0)T_4 + (-15 - \frac{-1}{-3} \times -5)T_5 + (2 - \frac{-1}{-3} \times -1)T_6 = (-43 - \frac{-1}{-3} \times 12)$

$$\begin{aligned}
T_1 + T_2 - 2T_3 + T_4 + 3T_5 - T_6 &= 4 \\
0 - 3T_2 + 5T_3 + 0T_4 - 5T_5 - T_6 &= 12 \\
0 + 0 + 2.33T_3 - 2T_4 - 4.33T_5 + 1.33T_6 &= -11 \\
0 + 0 + 4T_3 - 6T_4 - 8T_5 + 7T_6 &= -35 \\
0 + 0 - 0.67T_3 + 6T_4 + 6.67T_5 - 0.67T_6 &= 36 \\
0 + 0 + 7.33T_3 - 10T_4 - 13.33T_5 + 2.33T_6 &= -47
\end{aligned}$$

Row 3 is the pivot

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

$$0 - 3T_2 + 5T_3 + 0T_4 - 5T_5 - T_6 = 12$$

$$0 + 0 + 2.33T_3 - 2T_4 - 4.3T_5 + 1.3T_6 = -11$$

$$0 + 0 + 0 - 2.57T_4 - 0.57T_5 + 4.71T_6 = -16.1429$$

$$0 + 0 + 0 + 5.43T_4 + 5.429T_5 - 0.286T_6 = 32.86$$

$$0 + 0 + 0 - 3.71T_4 + 0.2857T_5 - 1.86T_6 = -12.43$$

Row 4 is the pivot

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

$$0 - 3T_2 + 5T_3 + 0T_4 - 5T_5 - T_6 = 12$$

$$0 + 0 + 2.33T_3 - 2T_4 - 4.3T_5 + 1.3T_6 = -11$$

$$0 + 0 + 0 - 2.57143T_4 - 0.57T_5 + 4.71T_6 = -16.1429$$

$$0 + 0 + 0 + 0 + 4.22T_5 + 9.67T_6 = -1.22$$

$$0 + 0 + 0 + 0 + 0 + 4T_5 - 2.06T_6 = 10.053$$

Row 5 is the pivot

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

$$0 - 3T_2 + 5T_3 + 0T_4 - 5T_5 - T_6 = 12$$

$$0 + 0 + 2.33T_3 - 2T_4 - 4.3T_5 + 1.3T_6 = -11$$

$$0 + 0 + 0 - 2.57T_4 - 0.57T_5 + 4.71T_6 = -16.1429$$

$$0 + 0 + 0 + 0 + 4.22T_5 + 9.67T_6 = -1.22$$

$$0 + 0 + 0 + 0 + 0 - 11.21T_6 = 11.21$$

$$T_6 = \frac{11.21}{-11.21} = -1$$

$$T_5 = \frac{-1.22 - 9.67(-1)}{4.22} = 2$$

$$T_4 = \frac{-16.1429 - 4.71(-1) + 0.57(2)}{-2.57} = 4$$

$$T_3 = \frac{-11 - 1.3(-1) + 4.3(2) + 2(4)}{2.33} = 3$$

$$T_2 = \frac{12 + (-1) + 5(2) - 5(3)}{-3} = -2$$

$$T_1 = \frac{4 + -1 - 3(2) - 4 + 2(3) - (-2)}{1} = 1$$

$$T_6 = -1$$

$$T_5 = 2$$

$$T_4 = 4$$

$$T_3 = 3$$

$$T_2 = -2$$

$$T_1 = 1$$