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 ASSIGNMENT 3

Let $T_1 = a$, $T_2 = b$, $T_3 = c$, $T_4 = d$, $T_5 = e$, $T_6 = f$

$$a + b - 2c + d + 3e - f = 4 \quad \text{--- (1)}$$

$$2a - b + c + 2d + e - 3f = 20 \quad \text{--- (2)}$$

$$a + 3b - 3c - d + 2e + f = -15 \quad \text{--- (3)}$$

$$5a + 2b - c - d + 2e + f = -3 \quad \text{--- (4)}$$

$$-3a - b + 2c + 3d + e + 3f = 16 \quad \text{--- (5)}$$

$$4a + 3b + c - 6d - 3e - 2f = -27 \quad \text{--- (6)}$$

pivot equation is equ. (1)

$$2(a + b - 2c + d + 3e - f = 4) = 2a + 2b - 4c + 2d + 6e - 2f = 8$$

$$-1(a + b - 2c + d + 3e - f = 4) = -a - b + 2c - d + 3e - f = -4$$

$$5(a + b - 2c + d + 3e - f = 4) = 5a + 5b - 10c + 5d + 15e - 5f = 20$$

$$-3(a + b - 2c + d + 3e - f = 4) = -3a - 3b + 6c - 3d - 9e + 3f = -12$$

$$4(a + b - 2c + d + 3e - f = 4) = 4a + 4b - 8c + 4d + 12e - 4f = 16$$

Subtract equations

$$2a - b + c + 2d + e - 3f = 20$$

$$-2a + 2b - 4c + 2d + 6e - 2f = 8$$

$$= -3b + 5c - 5e - f = 12 \quad \text{--- 2'}$$

$$a + 3b - 3c - d + 2e + f = -15$$

$$-a + b - 2c + d + 3e - f = 4$$

$$= 2b - c - 2d - e + 2f = -19 \quad \text{--- 3'}$$

$$5a + 2b - c - d + 2e + f = -3$$

$$-5a + 5b - 10c + 5d + 15e - 5f = 20$$

$$= -3b + 9c - 6d - 13e + 16f = -23 \quad \text{--- 4'}$$

$$-3a - b + 2c + 3d + e + 3f = 16$$

$$-3a - 3b + 6c - 3d - 9e + 3f = -12$$

$$= 2b - 4c + 6d + 10e = -28 \quad \text{--- 5'}$$

$$\begin{aligned}
 4a + 3b + c - 6d - 3e - 2f &= -27 \\
 -4a + 4b - 8c + 4d + 12e - 4f &= 16 \\
 = -b + 9c - 10d - 15e + 2f &= -43 \quad \dots \dots 6'
 \end{aligned}$$

make equ. (2') new pivot equation:

$$\begin{aligned}
 \frac{2}{3}(-3b + 5c - 5e - f = 12) &= \frac{2b}{3} - \frac{10c}{3} + \frac{10e}{3} + \frac{2f}{3} = -8 \\
 -\frac{3}{3}(-3b + 5c - 5e - f = 12) &= -3b + 5c - 5e - f = 12 \\
 -\frac{3}{3}(-3b + 5c - 5e - f = 12) &= -3b + 5c - 5e - f = 12 \\
 \frac{2}{3}(-3b + 5c - 5e - f = 12) &= \frac{2b}{3} - \frac{10c}{3} + \frac{10e}{3} + \frac{2f}{3} = -8 \\
 -\frac{1}{3}(-3b + 5c - 5e - f = 12) &= -b + \frac{5c}{3} - \frac{5e}{3} - \frac{1}{3}f = 4
 \end{aligned}$$

Subtract Equations:

$$\begin{aligned}
 2b - c - 2d - e + 2f &= -19 \\
 -\frac{2b}{3} - \frac{10c}{3} + \frac{10e}{3} + \frac{2f}{3} &= -8 \\
 = \frac{7c}{3} - 2d - \frac{13e}{3} + \frac{4f}{3} &= -11 \quad \dots \dots 3''
 \end{aligned}$$

$$\begin{aligned}
 -3b + 9c - 6d - 13e + 6f &= -23 \\
 -3b + 5c - 5e - f &= 12 \\
 = 4c - 6d - 8e + 7f &= -35 \quad \dots \dots 4''
 \end{aligned}$$

$$\begin{aligned}
 2b - 4c + 6d + 10e &= 28 \\
 -2b + \frac{10}{3}c + \frac{10e}{3} + \frac{2}{3}f &= -8 \\
 = -\frac{2}{3}c + 6d + \frac{20}{3}e - \frac{2}{3}f &= 36 \quad \dots \dots 5''
 \end{aligned}$$

$$\begin{aligned}
 -b + 9c - 10d - 15e + 2f &= -43 \\
 -b + \frac{5c}{3} - \frac{5e}{3} - \frac{1}{3}f &= 4 \\
 = \frac{22}{3}c - 10d - \frac{40}{3}e + \frac{2}{3}f &= -47 \quad \dots \dots 6''
 \end{aligned}$$

make equ. (3'') new pivot equation:

$$\begin{aligned}
 \frac{42}{7}(\frac{7}{3}c - 2d - \frac{13}{3}e + \frac{4}{3}f = -11) &= 4c - \frac{24}{7}d - \frac{52}{7}e + \frac{16}{7}f = -\frac{132}{7} \\
 -\frac{2}{7}(\frac{7}{3}c - 2d - \frac{13}{3}e + \frac{4}{3}f = -11) &= -\frac{2}{3}c + \frac{4}{7}d + \frac{26}{21}e - \frac{8}{21}f = \frac{22}{7} \\
 \frac{22}{7}(\frac{7}{3}c - 2d - \frac{13}{3}e + \frac{4}{3}f = -11) &= \frac{22}{3}c - \frac{44}{7}d - \frac{286}{21}e + \frac{88}{21}f = -\frac{242}{7}
 \end{aligned}$$

Subtract equations

$$\begin{aligned} 4c - 6d - 8e + 7f &= -35 \\ -4c - 2\frac{4}{7}d - 5\frac{2}{7}e + \frac{16}{7}f &= -\frac{132}{7} \\ \hline &= -2.5714d - 0.5714e + 4.7142f = -16.1429 \quad \dots 4''' \end{aligned}$$

$$\begin{aligned} -2\frac{2}{3}c + 6d + 20\frac{2}{3}e - \frac{2}{3}f &= 36 \\ -2\frac{2}{3}c + 4\frac{4}{7}d + \frac{26}{21}e - \frac{8}{21}f &= \frac{22}{7} \\ \hline &= 5.42857d + 5.42857e - 0.28571f = 32.85714 \quad \dots 5''' \end{aligned}$$

$$\begin{aligned} 22\frac{2}{3}c - 10d - \frac{40}{3}e + \frac{2}{3}f &= -49 \\ -22\frac{2}{3}c - 44\frac{4}{7}d - \frac{286}{21}e + \frac{88}{21}f &= -242/7 \\ \hline &= -3.71429d + 0.285714e - 1.85714f = -12.4286 \quad \dots 6''' \end{aligned}$$

Make equ. (4''') new pivot equation

$$\begin{aligned} -2.1111(-2.5714d - 0.5714e + 4.7142f) &= +16.1429 \\ \hline &= 5.42857d + 1.2063e - 9.9521f = 34.0793 \end{aligned}$$

$$\begin{aligned} 1.44446(-2.5714d - 0.5714e + 4.7142f) &= 16.1429 \\ \hline &= -3.71429d - 0.82536e + 6.80947f = 23.31777 \end{aligned}$$

Subtract equations

$$\begin{aligned} 5.42857d + 5.42857e - 0.28571f &= 32.85714 \\ -5.42857d + 1.2063e - 9.9521f &= 34.0793 \\ \hline &= 4.2223e + 9.66639f = -1.2222 \quad \dots 5'''' \end{aligned}$$

$$\begin{aligned} -3.71429d + 0.285714e - 1.85714f &= -12.4286 \\ -3.71429d - 0.82536e + 6.80947f &= 23.31777 \\ \hline &= 1.1111e - 8.6667f = 10.8889 \quad \dots 6'''' \end{aligned}$$

Angle equ. 5'''' new pivot equation:

$$\begin{aligned} 0.2632(4.222e + 9.66639f) &= -1.2222 \\ \hline &= 1.1111e + 2.5442f = -0.32168 \end{aligned}$$

$$\begin{aligned} 1.1111e - 8.6667f &= 10.8889 \\ -1.1111e + 2.5442f &= -0.32168 \end{aligned}$$

$$= -11.2109f = 11.2106$$

$$f = \frac{11.2106}{11.2109} = -0.9999732 \approx -1$$

$$1.1111e = 8.6667(-1) = 10.889$$

$$e = \frac{10.889 - 8.6667}{1.1111} = 2$$

$$-3.71429d + 0.285714(2) - 1.85714(-1) = -12.4286$$

$$d = \frac{-12.4286 - 0.571428 - 1.85714}{-3.71429} = 4$$

from equ. (4'')

$$4c - 6d - 8e + 7f = -35$$

$$c = \frac{-35 + 24 + 8 - 7}{4} = \frac{12}{4} = 3$$

from equ. (3')

$$2b - c - 2d - e + 2f = -19$$

$$2b - 3 - 2(4) - 2 + 2(-1) = -19$$

$$2b - 3 - 8 - 2 - 2 = -19$$

$$b = \frac{-19 + 15}{2} = \frac{-4}{2} = -2$$

from equ. (1)

$$a + b - 2c + d + 3e - f = 4$$

$$a - 2 - 2(3) + 4 + 3(2) - (-1) = 4$$

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

$$a = 4 - 3 = 1$$

$$a = 1, b = -2, c = 3, d = 4, e = 2, f = -1$$

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