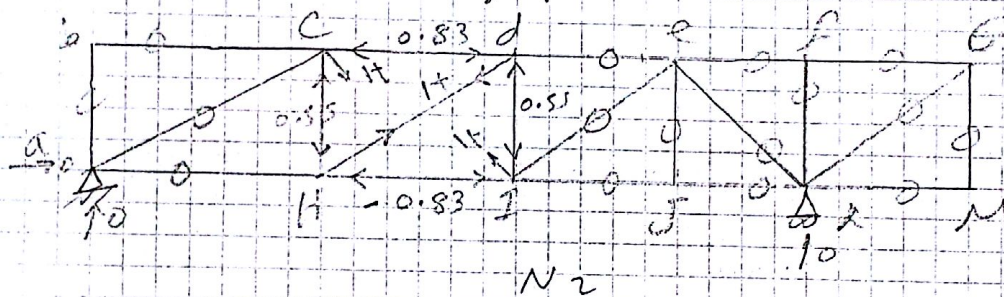
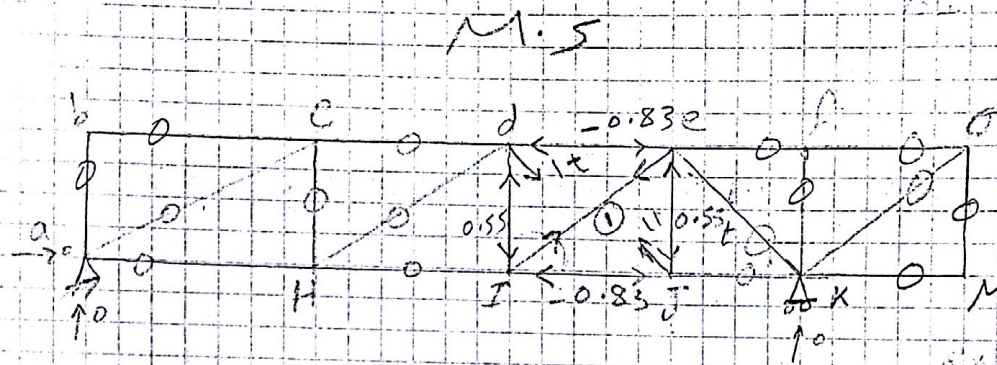
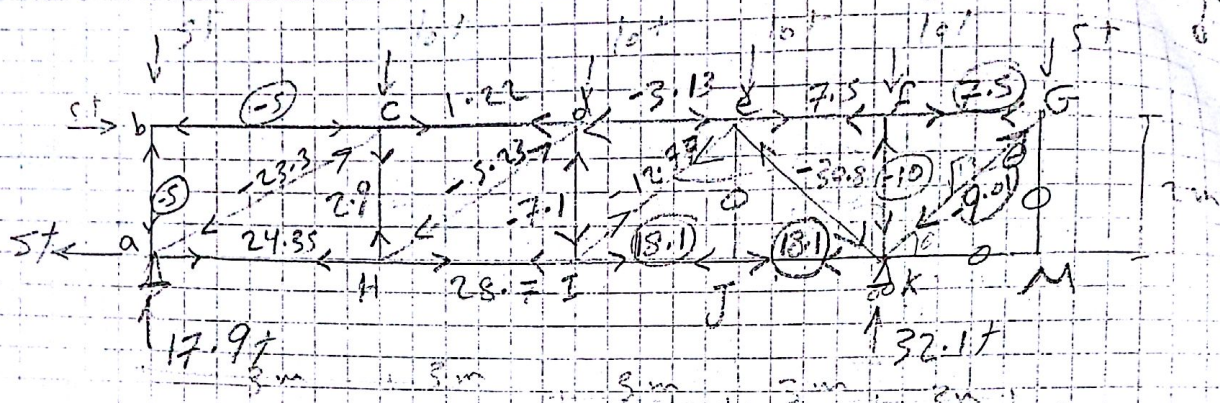


Sheet (3) TRUSS



NO	N_0	N_1	N_2	$L N_0 N_1$	$N_0 N_2 L$	$N_1 N_2 L$	L
ab	-5	0	0	0	0	0	2
bc	-5	0	0	0	0	0	2
ch	2.9	0	-0.55	0	2×-1.6	0	2
ah	24.35	0	0	0	0	0	3
ac	-23.3	0	0	0	0	0	$\sqrt{13}$
cd	+1.22	0	-0.83	0	3×-1.013	0	3
di	-7.1	-0.55	-0.55	2×3.905	2×3.91	2×0.303	2
eh	28.7	0	-0.83	0	-3×23.8	0	3
hd	-5.23	0	1	0	$\sqrt{13} \times -5.23$	0	$\sqrt{13}$
de	-3.13	-0.83	0	3×2.59	0	0	3
ej	0	-0.55	0	0	0	0	2
ji	18.1	-0.83	0	3×-15.03	0	0	3
ef	-12.77	+1	0	$\sqrt{13} \times -12.77$	0	0	$\sqrt{13}$
fk	7.5	0	0	0	0	0	3
km	-10	0	0	0	0	0	2
kj	18.1	0	0	0	0	0	3
ek	-30.8	0	0	0	0	0	$\sqrt{13}$
gm	-9.01	0	0	0	0	0	$\sqrt{13}$
km	0	0	0	0	0	0	2
		8.95	8.95	-79.53	-88.67	0.606	

Σ

$$\sigma_{01} = \sigma_{11} X_1 + \sigma_{12} X_2 = 0$$

$$\sigma_{02} = \sigma_{22} X_2 + \sigma_{12} X_1 = 0$$

$$\sigma_{01} = \frac{\sum N_{01} N_{1L}}{EA} = \frac{-75.23}{EA}$$

$$\sigma_{20} = \frac{\sum N_{02} N_{2L}}{EA} = \frac{-88.676}{EA}$$

$$\sigma_{12} = \frac{\sum N_{12} N_{2L}}{EA} = \frac{0.606}{EA}$$

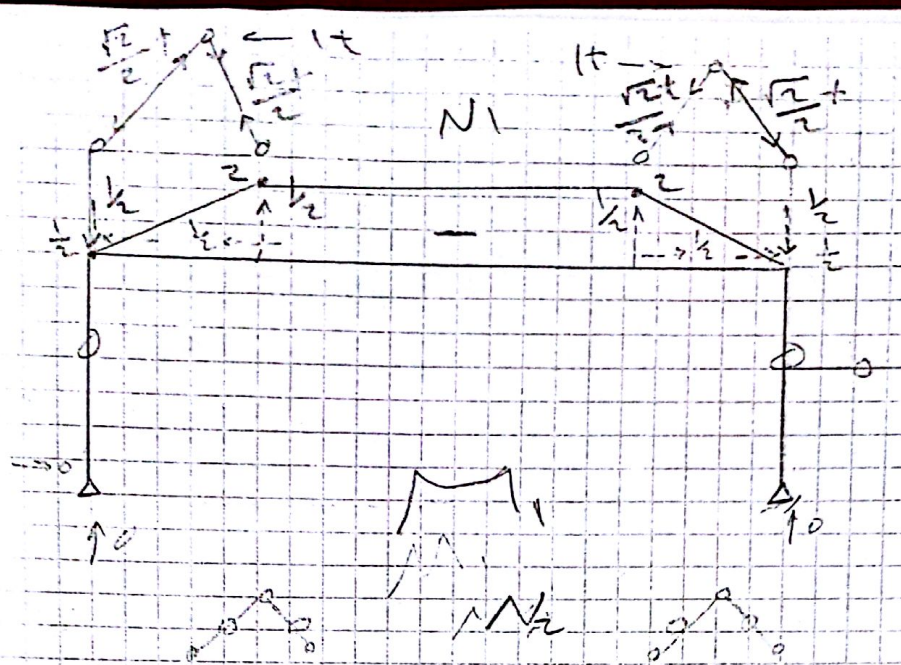
$$\sigma_{21} = \frac{\sum N_{21} N_{1L}}{EA} = \frac{8.95}{EA}$$

$$-\frac{75.23}{EA} + \frac{8.95}{EA} X_1 + \frac{0.606}{EA} X_2 = 0$$

$$-\frac{88.676}{EA} + \frac{8.95}{EA} X_2 + \frac{0.606}{EA} X_1 = 0$$

$$X_1 = 7.77 \text{ t}$$

$$X_2 = 9.38 \text{ t}$$



$$l = 2R \sin \theta$$

$$R = \frac{1}{2} \frac{l}{\sin \theta}$$

$$R = \frac{\sqrt{2}}{2} t$$

$$\begin{aligned} \omega_{10} &= \int \frac{M_0 M_1}{EI} + \int \frac{N_0 N_1}{EA} \\ &= \frac{-4}{6EI} \times (2 \times 2 \times 116 + 56 \times 2) - \frac{0.5 \times 166 \times 4 \times 2}{EI} + \frac{4}{6EI} [-2 \times 50 \times 2 \\ &= -\frac{384}{EI} - \frac{664}{EI} - \frac{368}{3EI} + \frac{4\sqrt{2}}{EA} - \frac{16\sqrt{2}}{EA} - \frac{3252}{EA} + \frac{9.9}{EA} \\ &= -\frac{1416}{EI} + \frac{5.66}{EA} \end{aligned}$$

$$\begin{aligned} \omega_{20} &= \frac{-4}{6EI} \times 244 \times 48 - \frac{4}{6EI} [2 \times 4 \times 116 + 2 \times 5 \times 56 + 56 \times 4 + 8 \times 11 \\ &+ \frac{0.5 \times 4 \times 8 \times 8}{EI} - \frac{0.5 \times 8 \times 172 \times 4}{EI} - \frac{0.5 \times 165 \times 4 \times 8}{EI} \\ &+ \frac{4[-50 \times 8 \times 2 + 3 \times 3 \times 2 + 3 \times 3 \times 30 \times 8]}{6EI} \\ &= -\frac{256}{EI} - \frac{2976}{EI} + \frac{128}{EI} - \frac{2752}{EI} - \frac{2640}{EI} - \frac{672}{EI} \\ &= -\frac{9168}{EI} \end{aligned}$$

$$\omega_{12} = \frac{0.5 \times 8 \times 4 \times 2}{EI} \times 2 + \frac{2 \times 4 \times 8}{EI} = \frac{96}{EI}$$

$$\omega_{22} = \frac{8}{6EI} \times (2 \times 8 \times 8) + \frac{12 \times 8 \times 8}{EI} + \frac{8}{3EI} [2 \times 3 \times 8] = \frac{3328}{3EI}$$

$$\omega_{11} = \frac{4}{6EI} [2 \times 2 \times 2] \times 2 + \frac{2 \times 2 \times 4}{EI} + 2 \times \frac{1}{2} \times \frac{2}{EA} + \frac{1}{EA} + \frac{1}{EA} + \frac{50}{EA} + \frac{\sqrt{2}}{EA}$$

$$S_{10} + S_{11}X_1 + S_{12}X_2 = 0$$

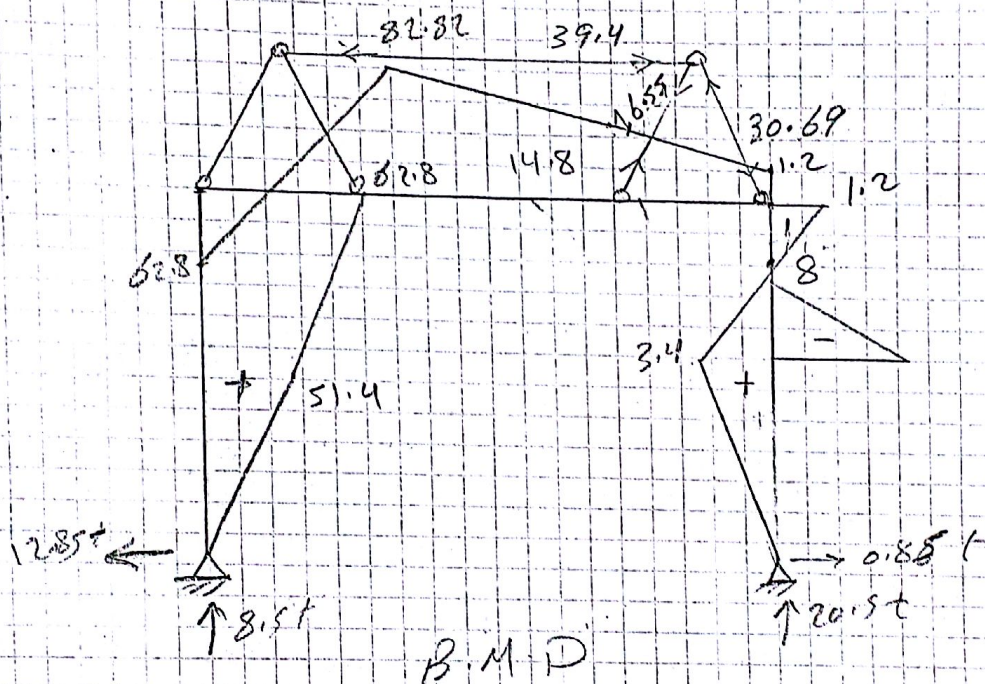
$$S_{20} + S_{22}X_2 + S_{12}X_1 = 0$$

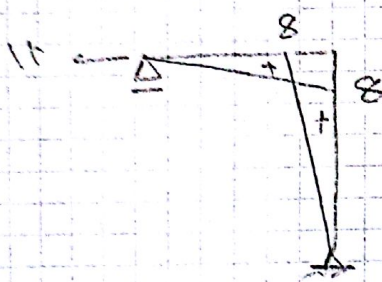
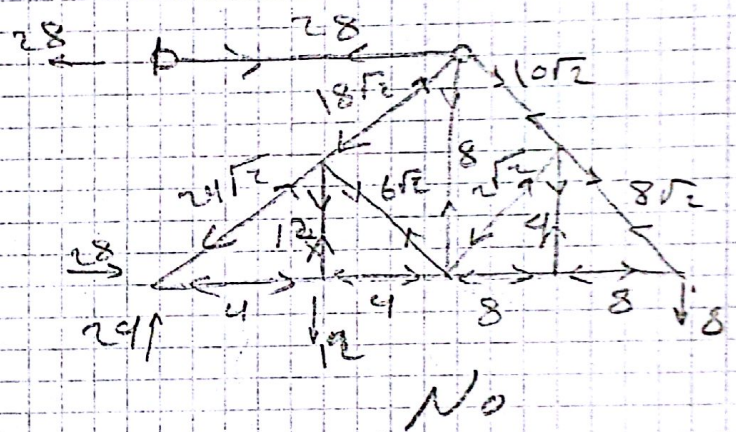
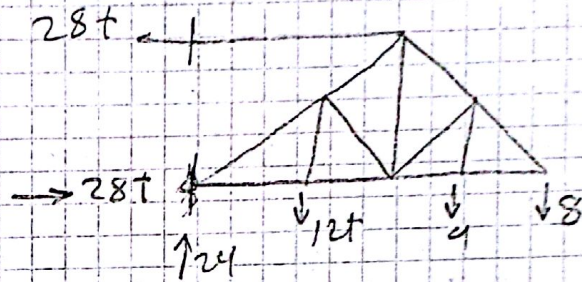
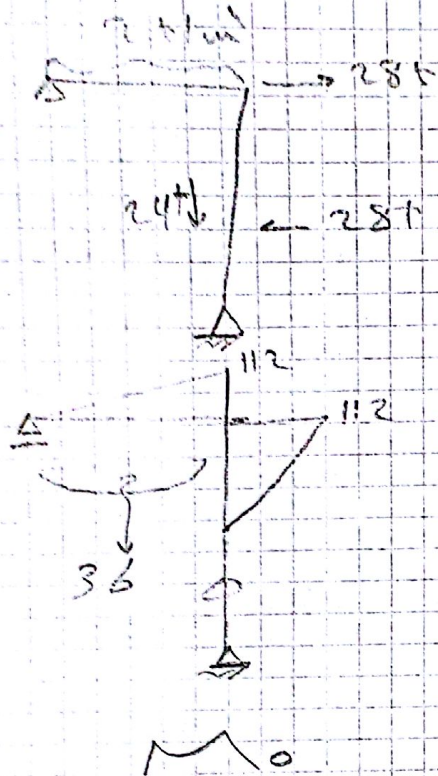
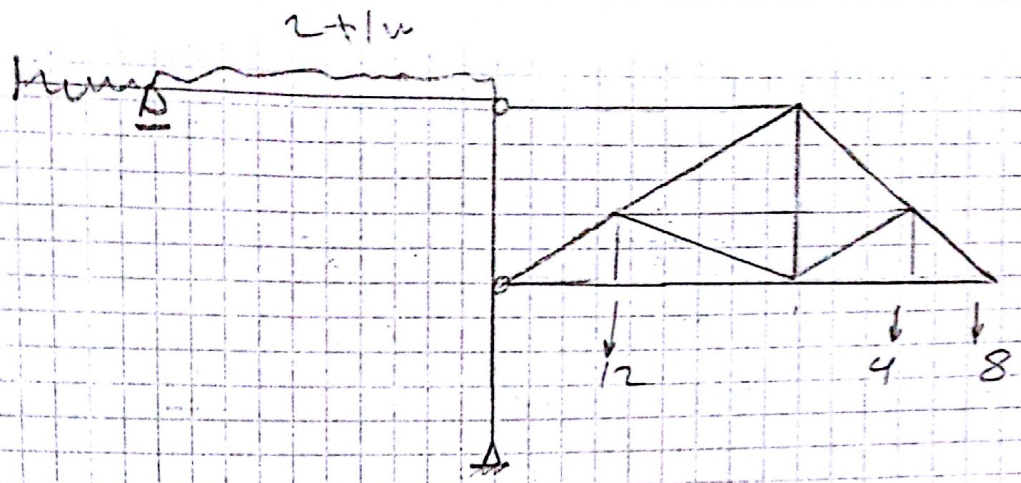
$$\frac{-1416}{EI} + \frac{5.56}{EA} + \left(\frac{80}{3EI} + \frac{\sqrt{2}}{EA} \right) X_1 + \frac{96}{EI} X_2 = 0$$

$$\frac{-9168}{EI} + \frac{3328}{EI} X_2 + \frac{96}{EI} X_1 = 0$$

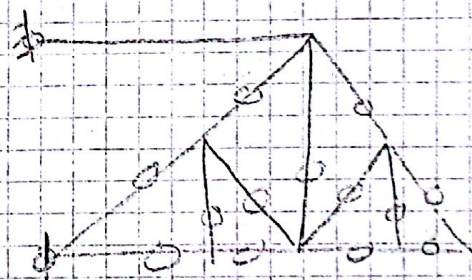
$$EI = 40000 \text{ t.m}^2$$

$$EA = 10000 \text{ t/m}$$

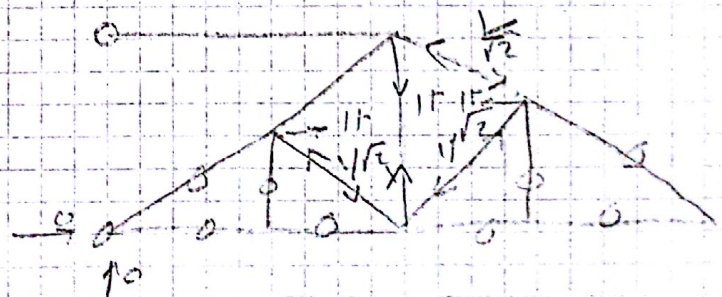




M₁



N₁



M₂

$$\delta_{10} = \frac{1}{EI} \left[-\frac{4}{\delta} [2 \times 8 \times 112 + 112 \times 4] - \frac{6}{2} \times 8 \times 112 \right] + \frac{1}{10000} \sum N_0 N_1$$

$$\delta_{10} = \frac{-9424}{3} = \frac{-314133}{EI}$$

$$\delta_{11} = \int \frac{M_1}{EI} dy + \int \frac{N_1^2}{EA} L$$

$$= \frac{1}{EI} \int \left[\frac{8}{3} \times 8^2 + \frac{6}{3} \times 8^2 \right] dy + 0 = \frac{896}{3EI}$$

$$\delta_{11} = \frac{896}{3EI}$$

$$\delta_{12} = 0$$

$$\delta_{20} = \frac{1}{10000} \left[1 \times 8 - \frac{1}{\sqrt{2}} (-18\sqrt{2} + 10\sqrt{2} - 2\sqrt{2} - 6\sqrt{2}) \right]$$

$$\delta_{20} = \frac{24}{10000}$$

$$\delta_{22} = \frac{1}{10000} \left[4 \times \left(\frac{1}{\sqrt{2}} \right)^2 + 1 \times 1 \right] = \frac{3}{10000}$$

$$\delta_{22} = \frac{3}{10000}$$

$$\therefore \frac{-9424}{3 \times 40000} + \frac{896}{3 \times 40000} X_1 + 0 = \frac{-X_1}{10000}$$

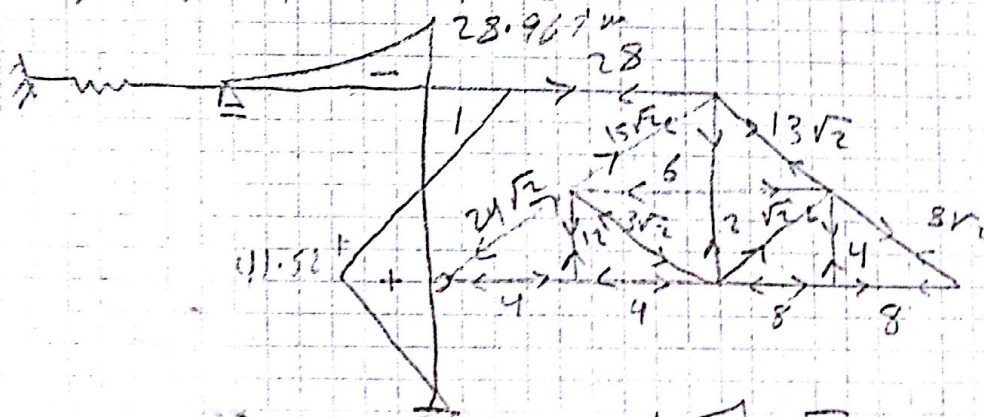
$$X_1 = 10.37885 \text{ t}$$

$$\frac{24}{10000} + 0 + \frac{3}{10000} X_2 = \frac{-X_2}{10000}$$

$$4X_2 = -24 \quad X_2 = -6 \text{ t}$$

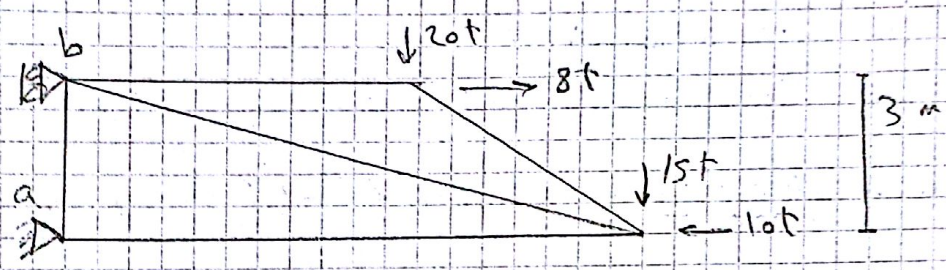
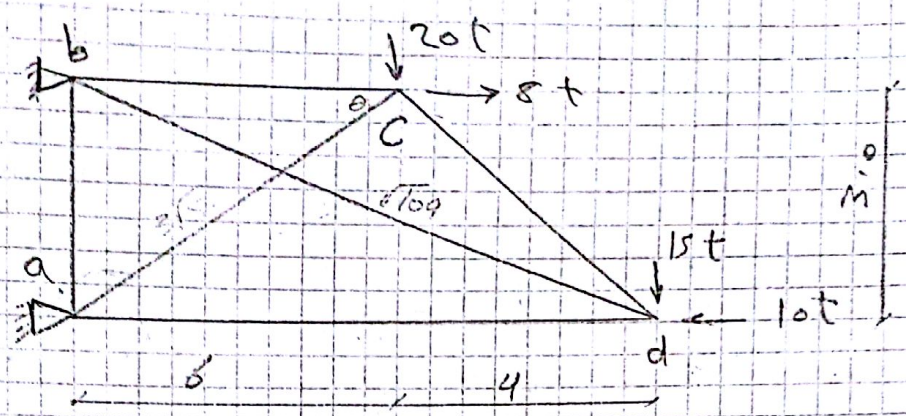
$$M_F = M_0 + M_1 X_1 + M_2 X_2$$

$$N_F = N_0 + N_1 X_1 + N_2 X_2$$

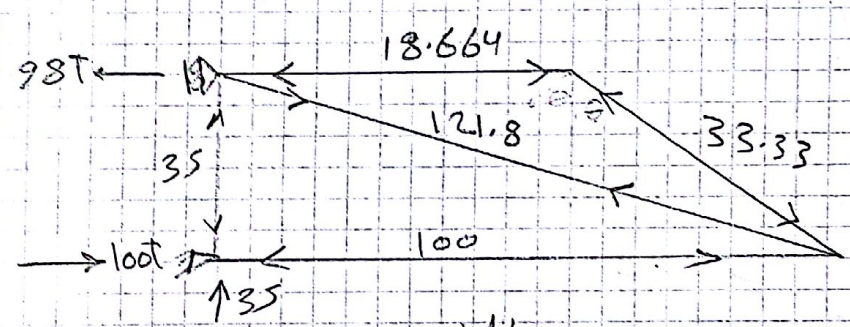


M_F & N_F

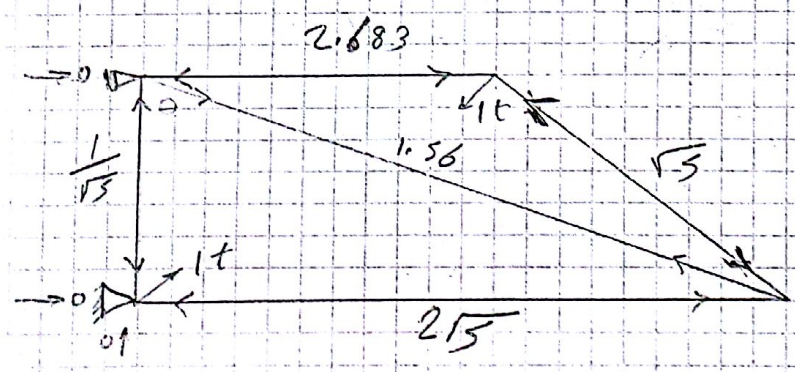
2



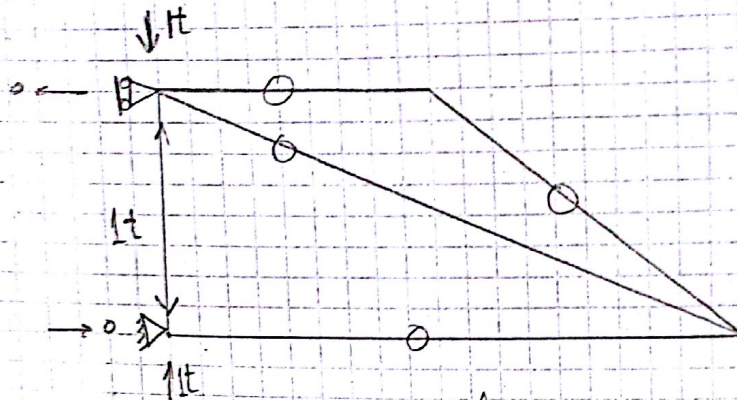
M.5



No



N₁



N_2

$$\delta_{10} + \delta_{11} x_1 + \delta_{12} x_2 = 0$$

$$\delta_{20} + \delta_{12} x_1 + \delta_{22} x_2 = 0$$

$$\delta_{10} = \frac{35 \times \frac{1}{\sqrt{5}} \times 3}{EA} + \frac{18.664 \times 2.683 \times 6}{EA} + \frac{121.8 \times 1.56 \times \sqrt{109}}{EA} + \frac{100 \times 2\sqrt{5} \times 10}{EA} + \frac{33.33 \times \sqrt{5} \times 5}{EA} = \frac{7175.92}{EA}$$

$$\delta_{20} = \frac{35 \times 1 \times 3}{EA} = \frac{105}{EA}$$

$$\delta_{22} = \frac{3}{EA}$$

$$\delta_{12} = \frac{\frac{1}{\sqrt{5}} \times 3}{EA}$$

$$\delta_{11} = \frac{\frac{1}{\sqrt{5}} \times \frac{1}{\sqrt{5}} \times 3}{EA} + \frac{2.683 \times 2.683 \times 6}{EA} + \frac{\sqrt{5} \times \sqrt{5} \times 5}{EA} + \frac{1.56 \times 1.56 \times \sqrt{109}}{EA} + \frac{2\sqrt{5} \times 2\sqrt{5} \times 10}{EA} = \frac{294.198}{EA}$$

$$\frac{7175.92}{EA} + \frac{294.198}{EA} x_1 + \frac{3}{\sqrt{5} EA} x_2 = 0$$

$$\frac{105}{EA} + \frac{3}{\sqrt{5} EA} x_1 + \frac{3}{EA} x_2 = 0$$

$$x_1 = -24.28 \quad x_2 = -24.14$$

2. N₂ = 0
def = 0

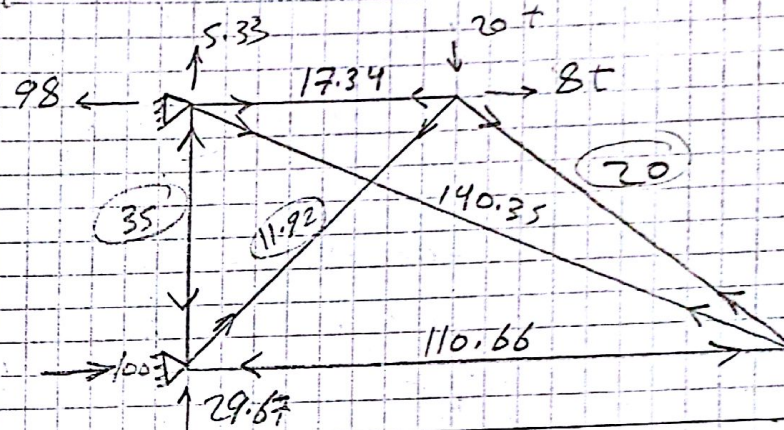
$$\text{out} = 0$$

$$\sigma_{21} + \sigma_{22} \lambda_2 + \lambda_1 \sigma_{12} = 0$$

$$X_1 = 11.92 \text{ t}$$

$$X_2 = -5.33 \text{ t}$$

$$\frac{3}{\sqrt{5}EA} + \frac{3}{EA} X_2 = 0$$



$$S_{15} + \sum R_{\text{sett}} = \text{zero}$$

$$813 + 0 = 0$$

$$0.25 + 0 = 0$$

$$0.11x_1 + 0.12x_2 = 0$$

$$X_1 = 0.3 \quad X_2 = -66.8$$

$$\sigma_{12} X_1 + X_2 \sigma_{22} = -0.07$$

