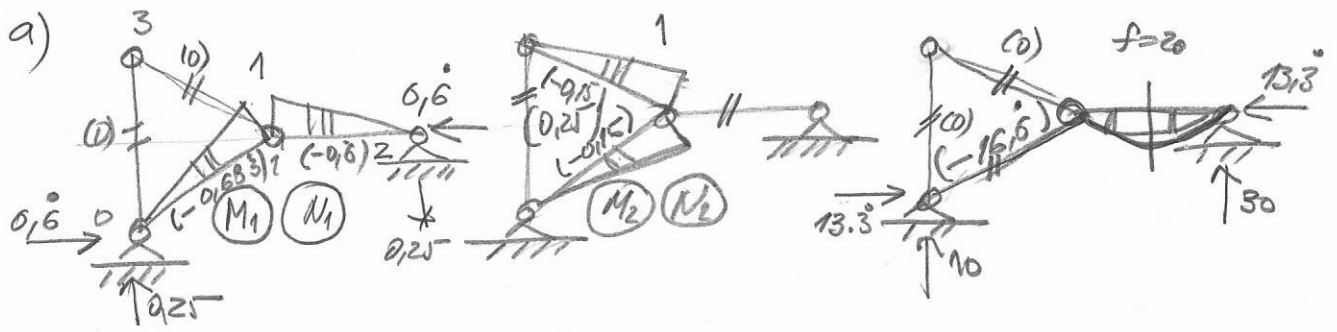


- a)  $M, T, N$   $EJ = 30 \text{ MNm}^2$
- b)  $M_{\Delta t}, M_C$   $\frac{J}{F} = 0,1$   $\Delta t = 1,10 / \text{C}$   $h = 0,9 \text{ m}$
- d)  $N_1$  IDEF. OSU OD a)

$\downarrow S_2 = 3 \text{ cm}$





$$EJ \delta_{M1} = \frac{5+4}{3} \cdot 1^2 \dots = 3$$

$$EJ \delta_{N1} = \frac{5}{3} \cdot 1 \cdot (-1) \dots = -1.6$$

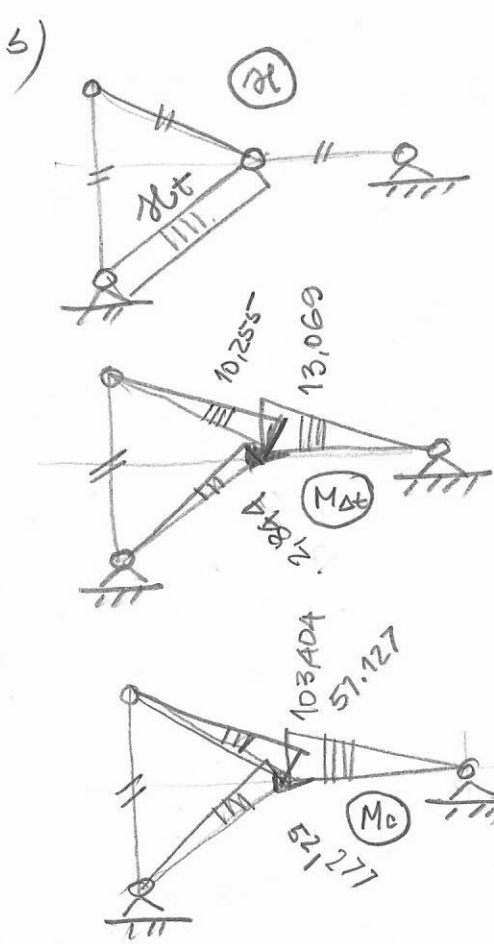
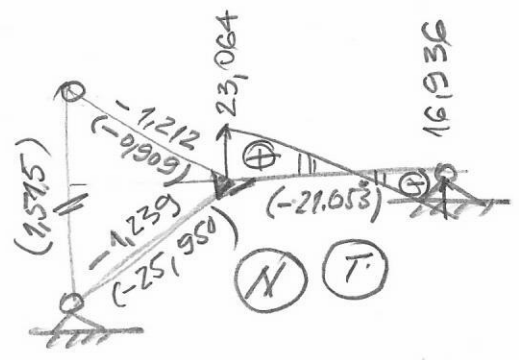
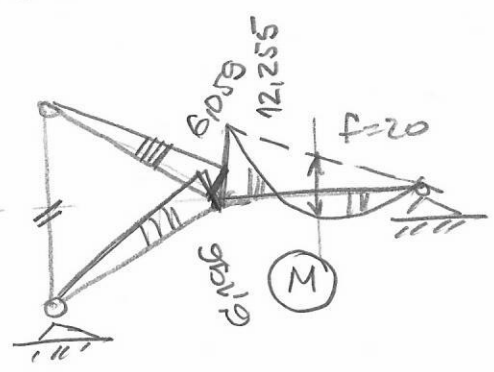
$$EJ \delta_{22} = 2 \cdot \frac{5}{3} \cdot 1^2 + 0.1 \cdot 0.6 \cdot 0.25^2 \dots = 3.37083$$

$$EJ \delta_{10} = \frac{4}{3} \cdot (-1) \cdot 20 \dots = -26.6$$

$$EJ \delta_{20} = 0$$

$$X_1 = 12.255$$

$$X_2 = 6.059$$



$$EJ \delta_{1at} = 30 \cdot 10 \cdot \frac{5}{2} \cdot (-1) \cdot 1 \cdot 10 \cdot \frac{-5 \cdot 30}{0.4} = -56.25$$

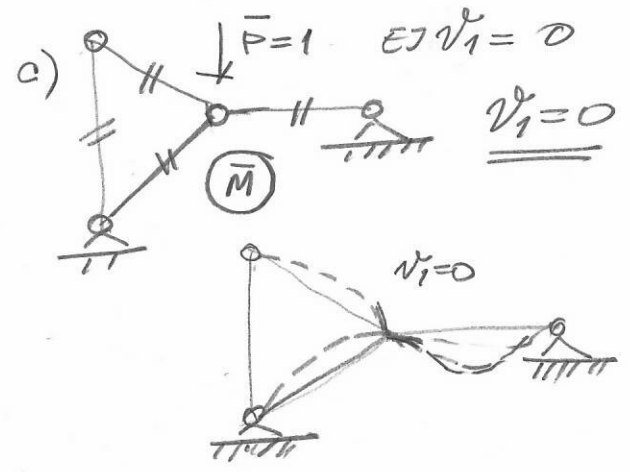
$$EJ \delta_{2at} = -EJ \delta_{1at} = 56.25$$

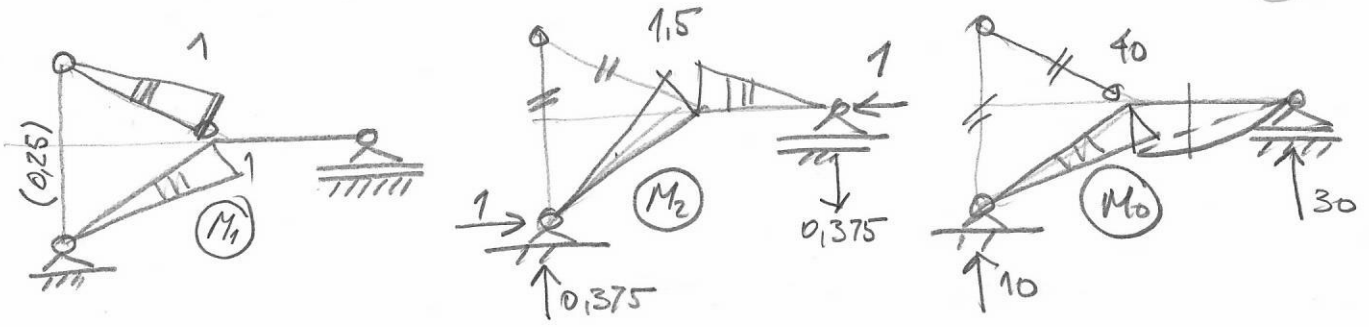
$$X_1 = 13.069 \quad X_2 = -10.225$$

$$EJ \delta_{1c} = -30 \cdot 10 \cdot 0.25 \cdot 0.03 = -225$$

$$EJ \delta_{2c} = 0$$

$$X_1 = 103.404 \quad X_2 = 57.127$$





$$EJ \delta_{m1} = 2 \cdot \frac{5}{3} \cdot 1^2 + 0,1 \cdot 6 \cdot 0,25^2 = 3,37083$$

$$X_1 = 6,059$$

$$EJ \delta_{n2} = \frac{5}{3} \cdot 1 \cdot (-1,5) = -2,5$$

$$X_2 = 34,836$$

$$EJ \delta_{22} = \frac{5+4}{3} \cdot 1,15^2 = 6,75$$

$$EJ \delta_{10} = \frac{5}{3} \cdot 1 \cdot 40 = 66,6$$

$$EJ \delta_{20} = \left(-\frac{1,15}{3}\right) [(5+4) \cdot 40 + 4 \cdot 20] = -220$$

$$EJ \delta_{1at} = 30 \cdot 10^3 \cdot \frac{5}{2} \cdot 1 \cdot 10 \cdot \frac{30}{0,4} \cdot 1 = 56,25$$

$$X_1 = -10,225$$

$$EJ \delta_{2at} = 30 \cdot 10^3 \cdot \frac{5}{2} \cdot 1 \cdot 10 \cdot \frac{30}{0,4} \cdot (-1,15) = -84,375$$

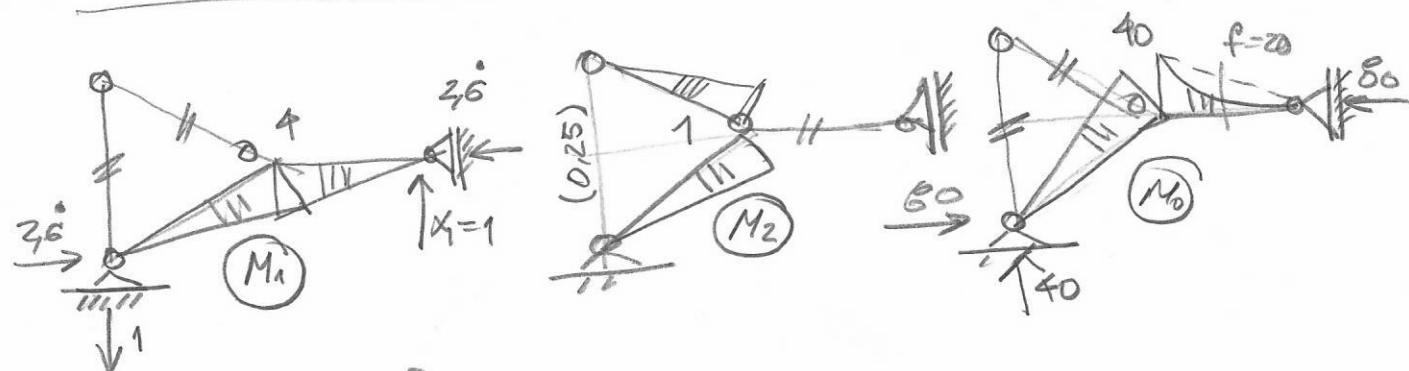
$$X_2 = 8,713$$

$$EJ \delta_{1c} = -30 \cdot 10^3 \cdot 0 \cdot 0,03 = 0$$

$$X_1 = 57,726$$

$$EJ \delta_{2c} = -30 \cdot 10^3 \cdot 0,375 \cdot 0,03 = -337,5$$

$$X_2 = 68,936$$



$$EJ \delta_{m1} = \frac{5+4}{3} \cdot 4^2 = 48$$

$$X_1 = 6,936$$

$$EJ \delta_{n2} = \frac{5}{3} \cdot 4 \cdot 1 = 6,6$$

$$X_2 = 6,059$$

$$EJ \delta_{22} = 2 \cdot \frac{5}{3} \cdot 1^2 + 0,1 \cdot 6 \cdot 0,25^2 = 3,37083$$

$$EJ \delta_{10} = \frac{-4}{3} [(5+4) \cdot 40 + 4 \cdot 20] = -373,3$$

$$EJ \delta_{20} = -\frac{5}{3} \cdot 1 \cdot 40 = -66,6$$

$$EJ \delta_{1at} = 30 \cdot 10^3 \cdot \frac{5}{2} \cdot 1 \cdot 10 \cdot \frac{30}{0,4} \cdot 4 = 225$$

$$X_1 = -3,267$$

$$EJ \delta_{2at} = 30 \cdot 10^3 \cdot \frac{5}{2} \cdot 1 \cdot 10 \cdot \frac{30}{0,4} \cdot 1 = 56,25$$

$$X_2 = -10,225$$

$$EJ \delta_{1c} = -30 \cdot 10^3 \cdot (-1) \cdot 0,03 = 900$$

$$X_1 = -25,057$$

$$EJ \delta_{2c} = -30 \cdot 10^3 \cdot 0 \cdot 0,03 = 0$$

$$X_2 = 57,727$$