

$$E = 210 \text{ kN/mm}^2$$

$$I_{165} = 9,35 \cdot 10^6 \text{ mm}^4$$

$$I_{200} = 2,14 \cdot 10^7 \text{ mm}^4$$

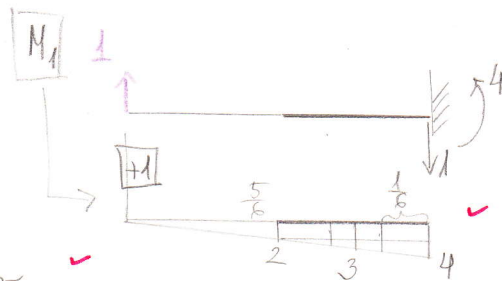
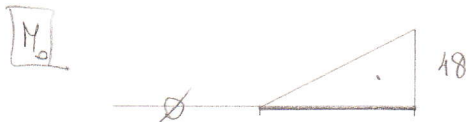
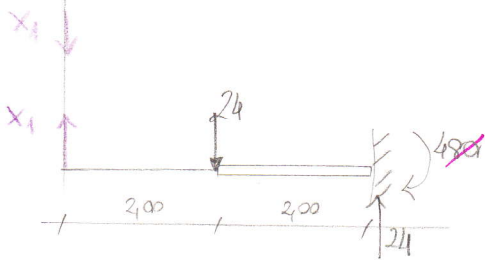
$$A_{\text{ss}} = 50 \text{ mm}^2$$

$$E \cdot I_1 = 1,963 \cdot 10^9 \text{ kNmm}^2$$

$$E \cdot I_2 = 4,494 \cdot 10^9 \text{ kNmm}^2$$

$$E \cdot A = 10500 \text{ kN}$$

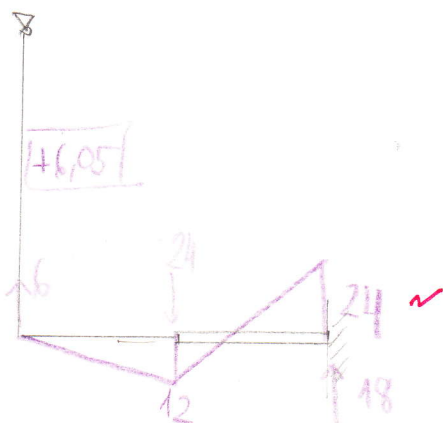
törstatö:



$$e_{10} = \frac{10^9}{E I_2} \left[\frac{48 \cdot 200}{2} \cdot \frac{4.5}{6} \right] = -35,6 \text{ mm}$$

$$e_{11} = \frac{12 \cdot 4,00 \cdot 10^3}{10500} + \frac{10^9}{1,963 \cdot 10^9} \left[\frac{2 \cdot 200}{2} \cdot \frac{2 \cdot 2}{3} \right] + \frac{10^9}{4,494 \cdot 10^9} \left[2 \cdot 200 \cdot 3 + \frac{2 \cdot 200 \cdot 4.5}{6} \right] = 5,891 \text{ mm}$$

$$e_{10} + e_{11} x_1 = 0 \quad x_1 = -\frac{e_{10}}{e_{11}} = -\frac{-35,6}{5,891} = 6,05 \text{ mm}$$

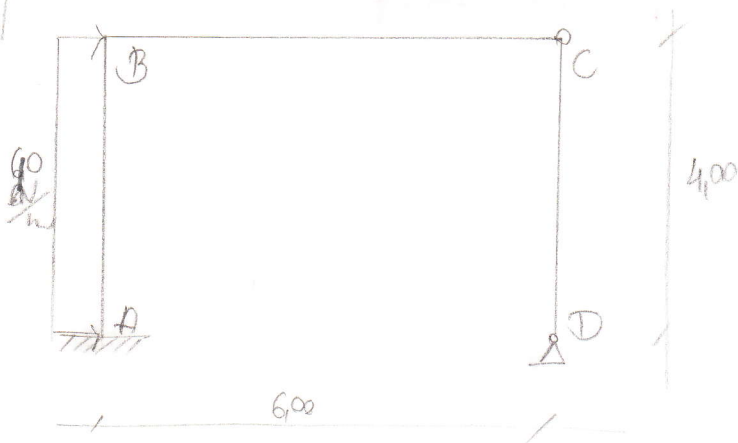


$$48 \cdot 4 \cdot 6 = 24 \text{ kNm}$$

$$2 \cdot 6 = 12 \text{ kNm}$$

$$24 - 6 = 18 \text{ kNm}$$

2

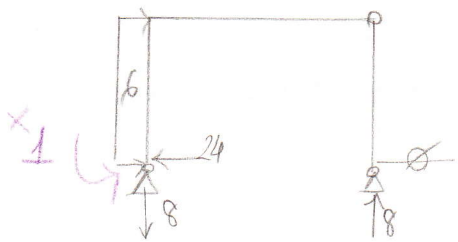


$$E \cdot I = 4,8 \cdot 10^9 \text{ Nm}^2$$

törzslast:

$$24 \cdot 4 - 6 \cdot 4 \cdot 2 = 48$$

$$24 \cdot 2 - 6 \cdot \frac{2^2}{2} = 24$$

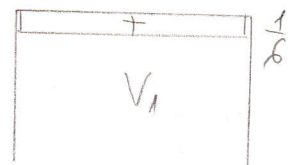
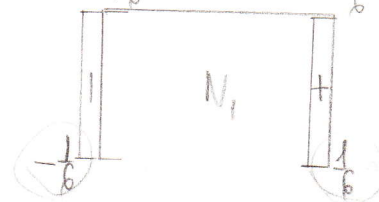
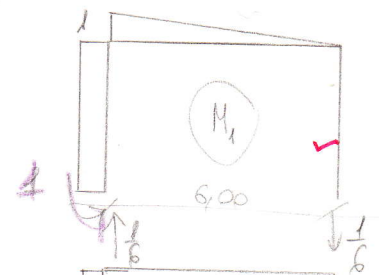
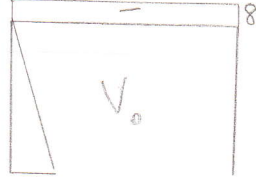
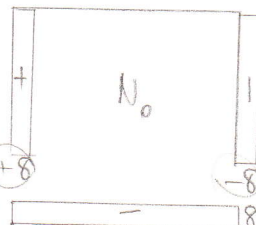
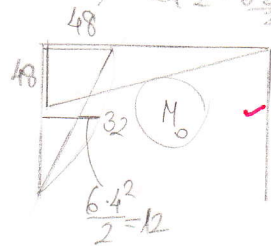


$$\sum M_A = 0 \quad 6 \cdot 4 \cdot 2 = D \cdot 6$$

$$D = 85 \text{ N} (\uparrow)$$

$$\sum M_{CB} = 0 \quad 6 \cdot 4 \cdot 2 + 8 \cdot 6 - D_x \cdot 4 = 0$$

$$D_x = 24 \text{ N} (\leftarrow)$$



$$e_{10} = \frac{10^9}{4,8 \cdot 10^9} \left(-\frac{48 \cdot 4,00}{2} \cdot 1 - 12 \cdot 4,00 \cdot \frac{2}{3} \cdot 1 - \frac{48 \cdot 6,00}{2} \cdot 1 \cdot \frac{2}{3} \right) = -46,67 \text{ mm}$$

$$e_{11} = \frac{10^9}{4,8 \cdot 10^9} \left(1 \cdot 4,00 \cdot 1 + \frac{16,00}{2} \cdot \frac{2}{3} \cdot 1 \right) = 1,25 \text{ mm}$$

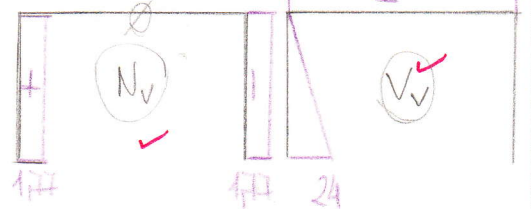
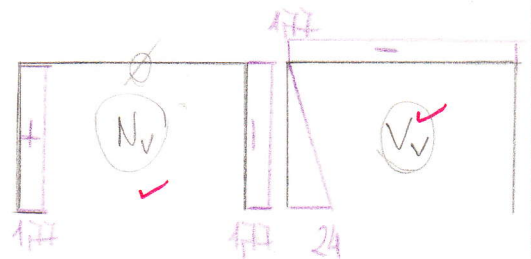
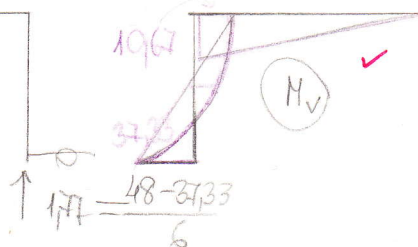
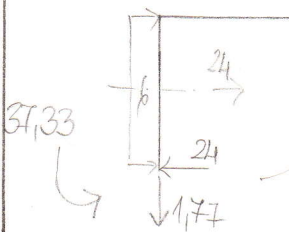
$$e_{10} + e_{11} \cdot x_1 = 0$$

$$1,25 \cdot x_1 = 46,67$$

$$x_1 = 37,33$$

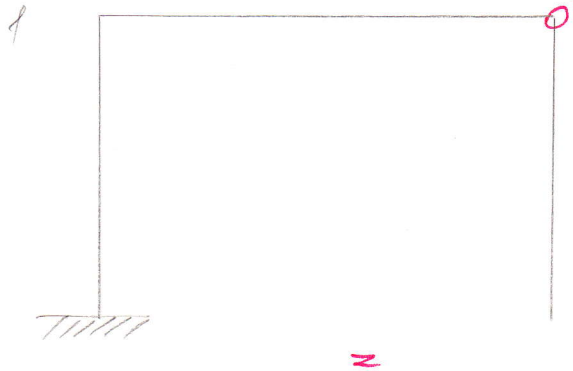
$$e_{10} = -e_{11} \cdot x_1$$

$$48 - 37,33 = 10,67$$



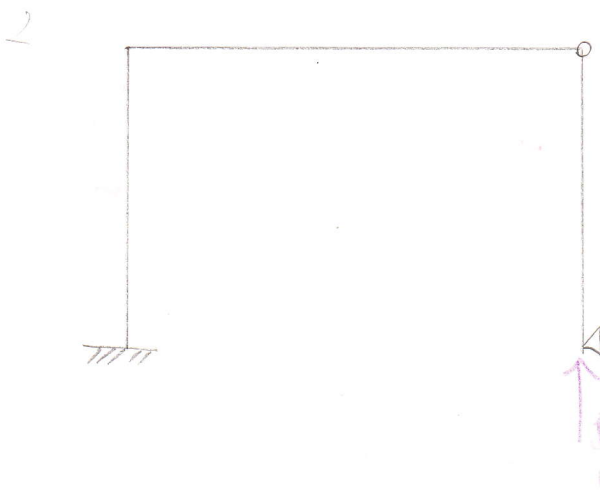
törzslast →

törzstabil:



ET ERŐDÍTŐLEG CSUKLÓ
NEM SZÁMÍTÁS HATÁRA
KÖZVETLENEN
1. szarv

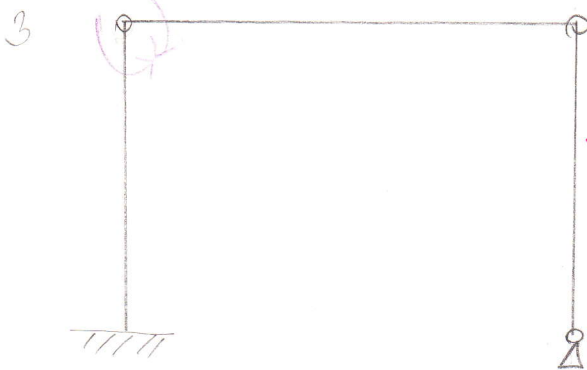
2



2. gerbstato

$y_D = 0$ eredeti teljes keretrendszer
behívásához függ. elmozd.

✓



keret + 3 csuklás

3) $\Delta \varphi_B = 0$ eredeti teljes keretrendszer
behívásához relatív
szögelfordulás

✓