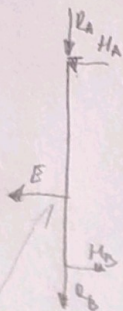
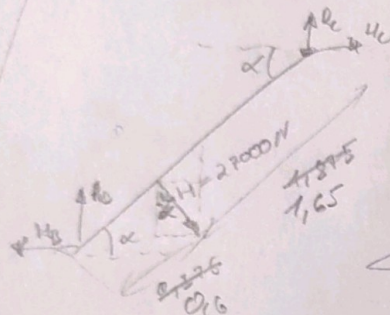
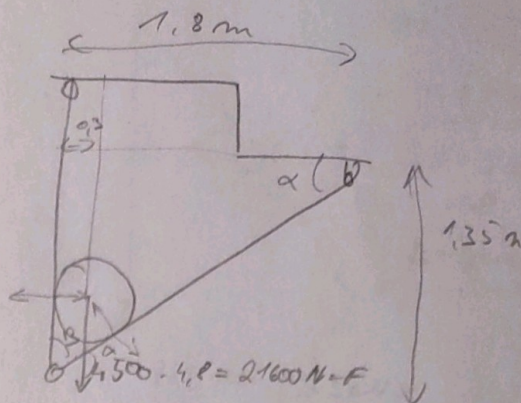
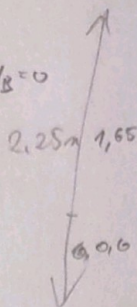


71)



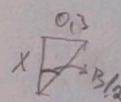
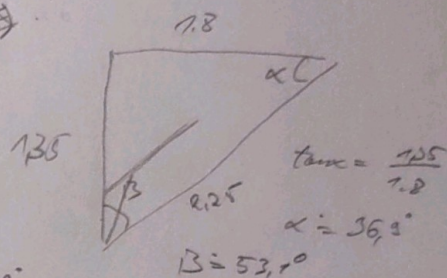
$$\begin{aligned} \rightarrow \sum F_x = 0: -H_A + H_B - 16210 &= 0 \\ \sum \mathcal{M}_A = -165 \cdot 16210 + 2.25 H_B &= 0 \\ H_B &= 11890 \text{ N} \\ H_A &= 4320 \text{ N} \end{aligned}$$



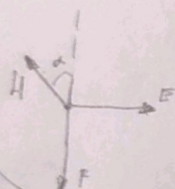
$$\begin{aligned} \sum \mathcal{M}_C &= +1.65 \cdot 27000 - 11890 \cdot (1.35 + 0.6) \\ &\quad - (11890) \cdot R_B = 0 \end{aligned}$$

$$R_B = 15840 \text{ N}$$

$$\begin{aligned} R_C &= 15840 + H \cdot \cos \alpha = \\ &= 15840 + 27000 \cdot \cos 36.8^\circ \\ &= 5760 \text{ N} \\ &= 2320 \text{ N} - R_C \end{aligned}$$



$$x = \frac{0.3}{\tan \frac{\beta}{2}} = 0.6 \text{ m}$$

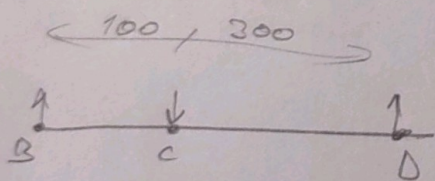


$$F \sin \alpha = H$$

$$H = \frac{27000}{\cos 36.8^\circ} = 27000 \text{ N}$$

$$F = H \sin \alpha = 27000 \cdot \sin 36.8^\circ = 16210 \text{ N}$$

72)

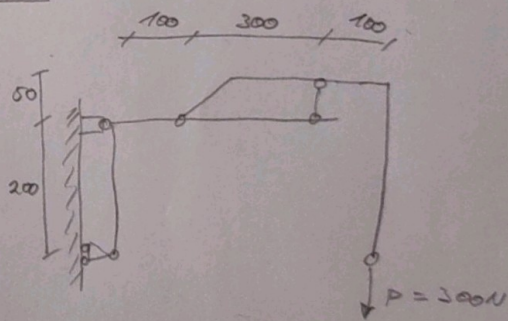


$$\sum \mathcal{M}_C = +300 \cdot 100 + 300 D = 0$$

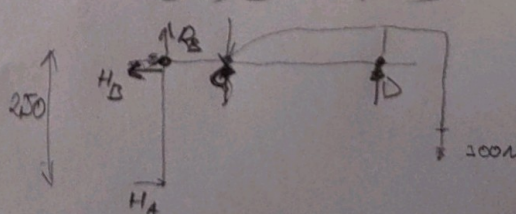
$$D = 100$$

$$\sum \mathcal{M}_D = C \cdot 300 - 300 \cdot 400 = 0$$

$$C = 400 \text{ N}$$

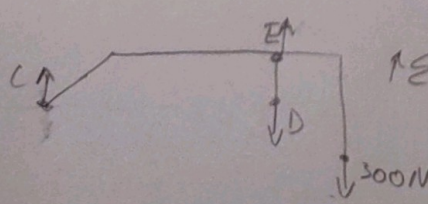


Total rigid body



$$\sum \mathcal{M}_D = H_B \cdot 200 - 300 \cdot 300 = 0$$

$$H_B = 450 \text{ N}, H_A = 360 \text{ N}, R_B = 300 \text{ N}$$

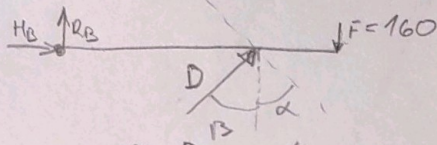


$$\sum F_y = C + E - D - 300 \text{ N} = 0$$

$$400 + E - 100 - 300 = 0$$

$$E = 0 \text{ N}$$

74)



$$\sum \mathcal{M}_B = D \cdot \cos \beta \cdot 8 - 160 \cdot 12 = 0$$

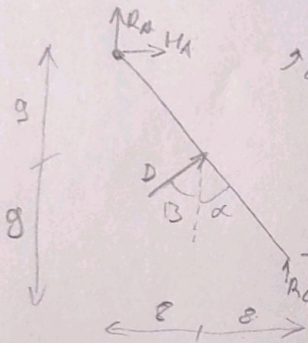
$$D = 361 \text{ N}$$

$$\sum F_y = D \sin \beta + R_B - F = 0$$

$$R_B = -240 + 160 = -80 \text{ N} = R_B$$

$$\rightarrow \sum F_x = D \sin \beta = -H_B$$

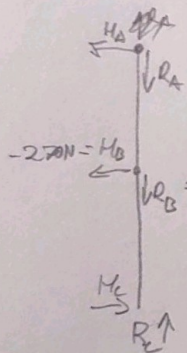
$$H_B = -270 \text{ N}$$



$$\sum \mathcal{M}_E = 8 \cdot 367 \cdot \cos 48,37 + 9 \cdot 367 \cdot \sin 48,37 - 18 \cdot 135 - 16 \cdot R_A = 0$$

$$R_A = 120 \text{ N}$$

$$R_E = 120 \text{ N}$$



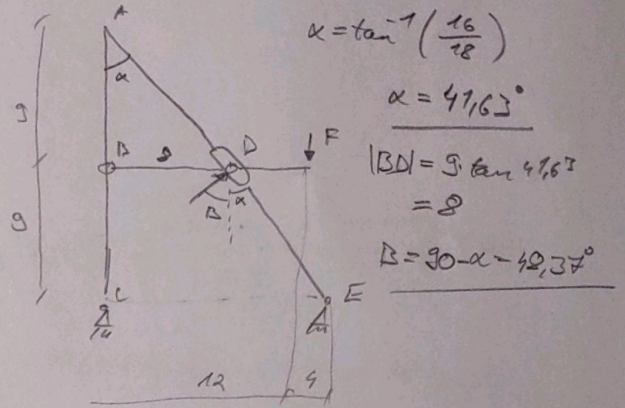
$$\sum \mathcal{M}_A = 18 \cdot H_E - (-270) \cdot 9 = 0, H_E = 135 \text{ N}$$

$$H_E = (-270) - H_A = 135$$

$$\rightarrow \sum F_x = -H_A - (-270) - 135 = 0$$

$$H_A = -135 \text{ N}$$

$$R_C = 40 \text{ N}$$

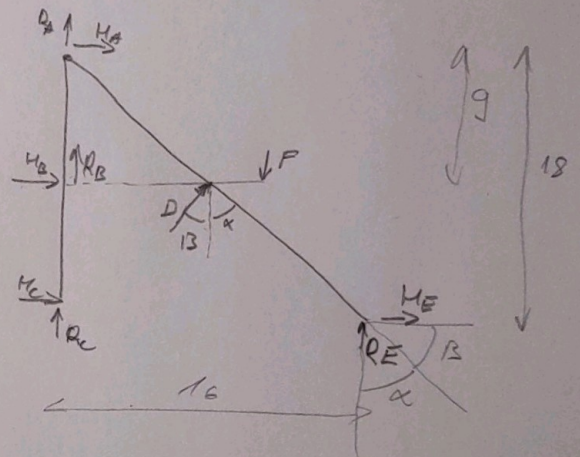


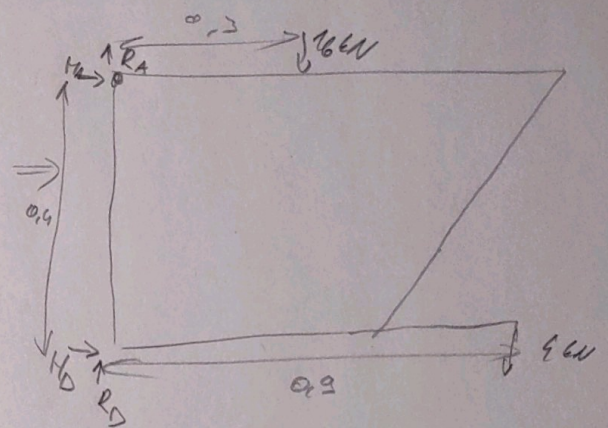
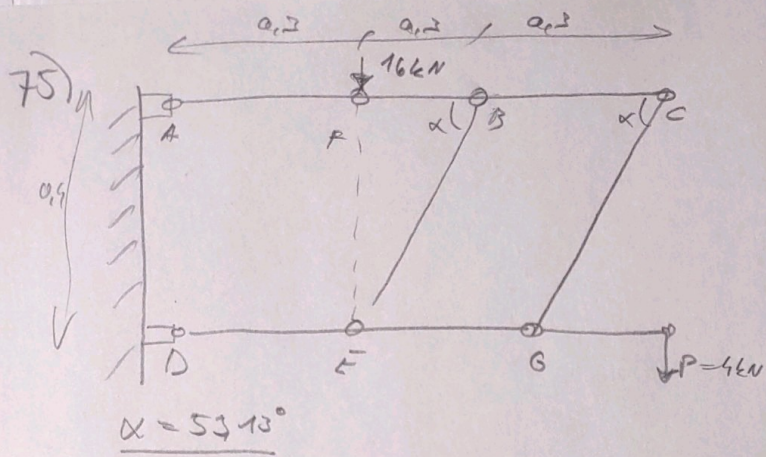
$$\alpha = \tan^{-1} \left(\frac{16}{18} \right)$$

$$\alpha = 41,63^\circ$$

$$|BD| = 9 \tan 41,63^\circ = 8$$

$$\beta = 90 - \alpha - 42,37^\circ$$





$$\sum M_A = -0.9 \cdot 4 \text{ kN} - 0.2 \cdot 16 \text{ kN} + 0.9 \cdot H_D = 0$$

$$H_D = 21 \text{ N} \Rightarrow H_A = -21 \text{ kN}$$