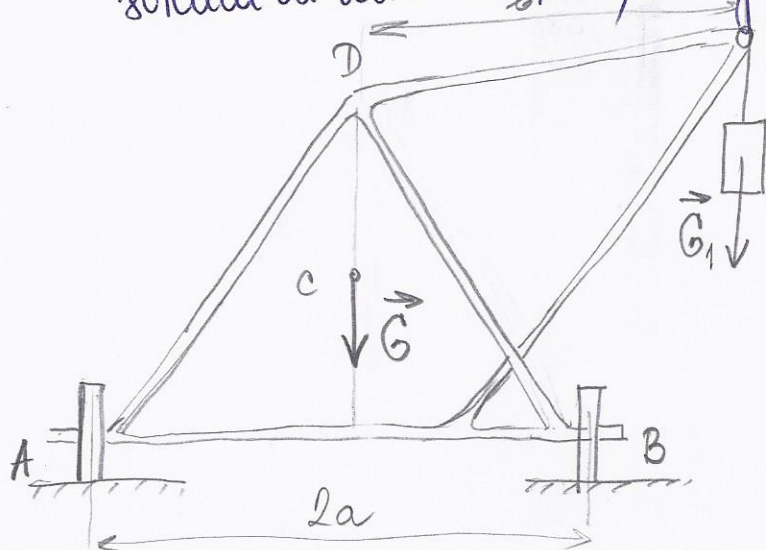


ZADACI VI

1

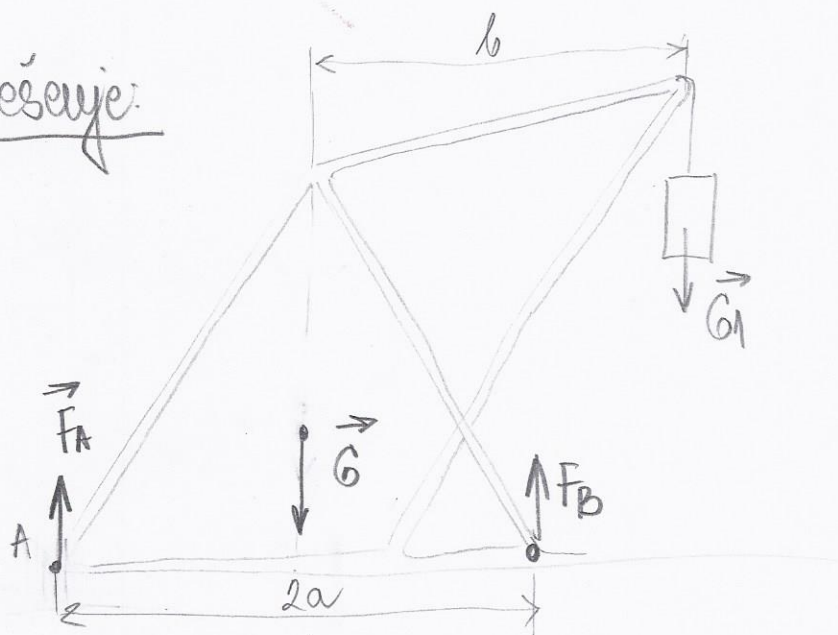
Zadatak 1: Odrediti sile kojima točnovi A i B dizalice, koja je shematski prikazana na slici 63, pritiskuju na širne. Težina dizalice iznosi $G = 4 \text{ MP}$, njeno težište leži na pravcu DE. Težina tereta koji dizalica podiže iznosi $G_1 = 1 \text{ MP}$, širica dizalice $b = 3,5 \text{ m}$, rastojanje $AB = 2a = 2,5 \text{ m}$.



$$1 \text{ MP} = 1 \text{ Megapond} = 980 \text{ N}$$

$$1 \text{ p} = 90098 \text{ N}$$

Rešenje:



$$G = 4 \text{ MP}$$

$$G_1 = 1 \text{ MP}$$

$$2a = 2,5 \text{ m} \rightarrow a = 1,25 \text{ m}$$

$$b = 3,5 \text{ m}$$

J-me ravnoteže:

$$(1) \sum Y_i = 0 \Rightarrow F_A - G + F_B - G_1 = 0$$

$$(2) \sum M_A = 0 \Rightarrow -G \cdot a + F_B \cdot 2a - G_1 \cdot (a+b) = 0$$

$$\text{iz j-me (2)} \rightarrow F_B \cdot 2a = G \cdot a + G_1 \cdot (a+b)$$

$$F_B = \frac{G \cdot a + G_1 \cdot (a+b)}{2a}$$

$$F_B = \frac{4\text{Mp} \cdot 1,25\text{m} + 1\text{Mp} \cdot (1,25\text{m} + 3,5\text{m})}{2,5\text{m}}$$

$$\boxed{F_B = 3,9\text{Mp}}$$

$$\sum \vec{F}_x = 0 \rightarrow F_A = G - F_B + G_1$$

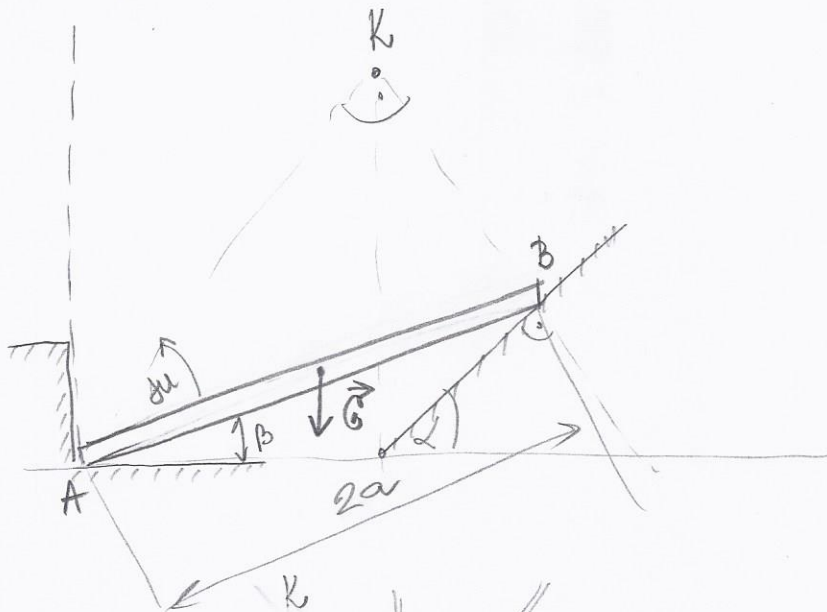
$$F_A = 4\text{Mp} - 3,9\text{Mp} + 1\text{Mp}$$

$$F_A = 1,1\text{Mp}$$

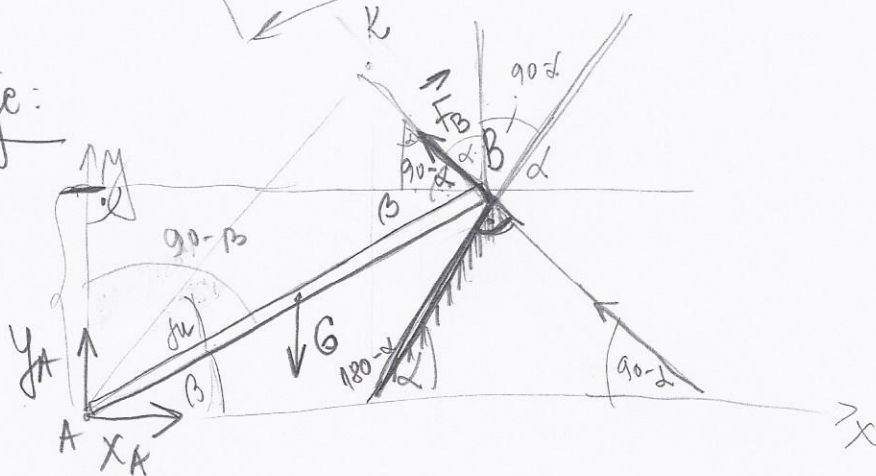
Prova:

$$\sum M_B = -F_A \cdot 2a + G \cdot a - G_1 \cdot (b-a) = 0 \quad \checkmark$$

Zadatak 2: Homogena greda AB težine G up, oslonjena se u krajem A na glatku horizontalnu ravan i u gornjem D, a u krajem B na strmou ravan, koja sa horizontalom zaklapa ugao α . Greda je nagnuta prema horizontu pod uglom β . Odrediti sile pritiska grede na obe ravni i na ispruž D.



Rešenje:



Uvjet ravnoteže:

- (1) $\sum X_i = 0 \Rightarrow X_A - F_B \cos(90 - \alpha) = 0 \Rightarrow X_A = F_B \sin \alpha$
- (2) $\sum Y_i = 0 \Rightarrow Y_A - G + F_B \sin(90 - \alpha) = 0 \Rightarrow Y_A = G - F_B \cos \alpha$
- (3) $\sum M_A = 0 \Rightarrow -G \cdot a \cos \beta + F_B \cdot 2a \cos \beta = 0$

$$17 \text{ j-ne(3)} \Rightarrow F_B \cdot 2a \cos \mu = G \cdot a \cos \beta$$

$$F_B = \frac{G \cdot a \cdot \cos \beta}{2a \cos \mu}$$

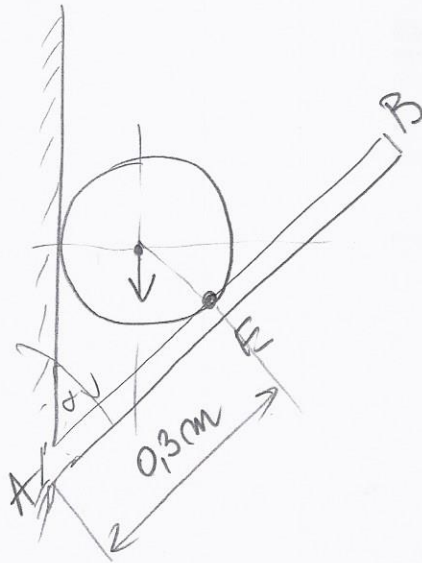
$$F_B = \frac{G}{2} \cdot \frac{\cos \beta}{\cos \mu}$$

$$17 \text{ j-ne (1)} \Rightarrow X_A = \frac{G}{2} \frac{\cos \beta}{\cos \mu} \cdot \sin \mu$$

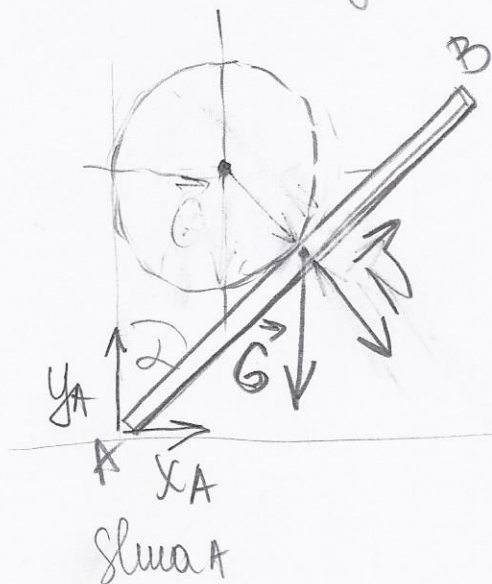
$$12 \text{ j-ne (2)} \Rightarrow Y_A = G - \frac{G}{2} \frac{\cos \beta}{\cos \mu}$$

$$Y_A = G \left(1 - \frac{1}{2} \frac{\cos \beta}{\cos \mu} \right)$$

Zadatak 3: Greda AB dužine $b = 0,8 \text{ m}$ i težine $G = 100 \text{ kp}$,
 uzidana je u zid i sa njim zaklapa ugao
 $\alpha = 60^\circ$. Unutar ugla DAB leži cilindar težine
 $G_1 = 180 \text{ kp}$, koji dodiruje gredu u tački E, pri čemu
 je $AE = a = 0,3 \text{ m}$. Odrediti reakciju uklještenja.



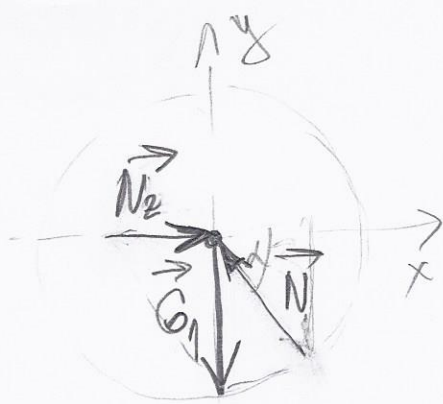
Rešenje: Oslobađanje od veza štapa



Oslobađanje od veza cilindra:



- Prvo odredujemo vrednost sile $\vec{N}$ sa slike 2.



$$(1) \sum X_i = 0 \Rightarrow N_2 + N \cos 30^\circ = 0$$

$$(2) \sum Y_i = 0 \Rightarrow -G_1 + N \sin 30^\circ = 0$$

$$N \sin 30^\circ = G_1$$

$$\boxed{N = \frac{G_1}{\sin 30^\circ}} = \frac{2 G_1}{1} = 2 G_1$$