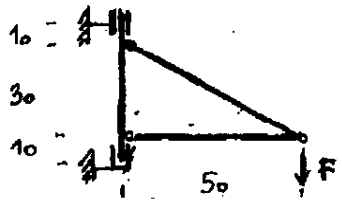
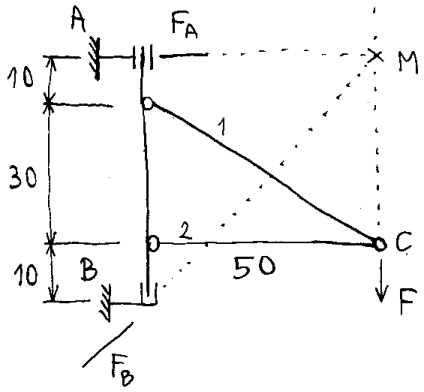
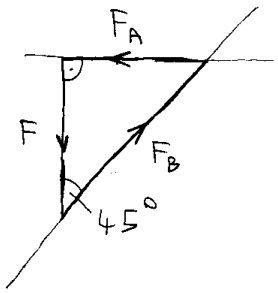
A 2010.02.26.-ai gyakorlaton áttekintett példa: Számítsuk ki a rúderőket és a reakcióerőket!

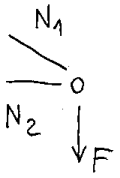


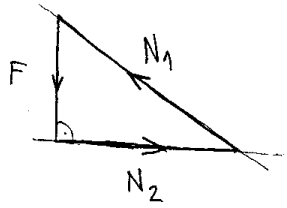


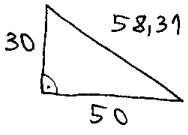


$F_A = F$

$F_B = \sqrt{2}\,F$





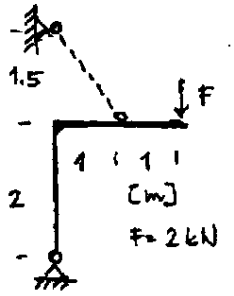


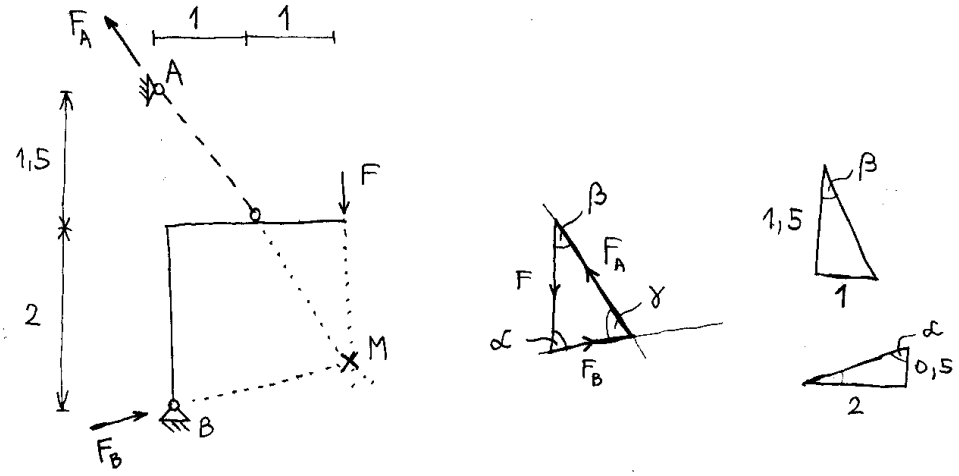
$$\frac{N_1}{F} = \frac{58{,}31}{30} \rightarrow \boxed{N_1 = F\,\frac{58{,}31}{30} = 1{,}944\,F}$$

$$\frac{N_2}{F} = \frac{50}{30} \rightarrow \boxed{N_2 = F\,\frac{50}{30} = 1{,}667\,F}$$

A 2010.02.26.-ai gyakorlaton áttekintett példa:

Határozzuk meg a reakcióerők irányát és nagyságát!





$$\operatorname{tg}\alpha = \frac{2}{0,5} = 4 \quad \rightarrow \quad \alpha = 75,96^\circ$$

$$\operatorname{tg}\beta = \frac{1}{1,5} = 0,667 \quad \rightarrow \quad \beta = 33,69^\circ$$

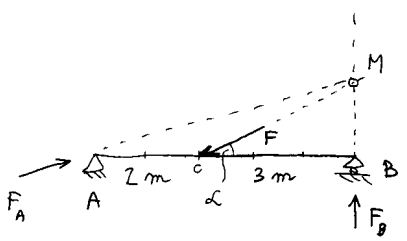
$$\gamma = 180^\circ - \alpha - \beta = 180^\circ - 75,96^\circ - 33,69^\circ = 70,35^\circ$$

$$\frac{F_A}{F} = \frac{\sin\alpha}{\sin\gamma} \quad \rightarrow \quad \boxed{F_A = \frac{\sin\alpha}{\sin\gamma} F = \frac{\sin 75,96^\circ}{\sin 70,35^\circ} F = 1,03\,F}$$

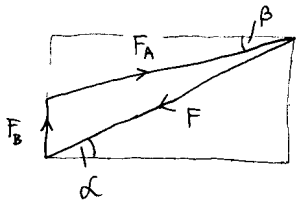
$$\frac{F_B}{F} = \frac{\sin\beta}{\sin\gamma} \quad \rightarrow \quad \boxed{F_B = \frac{\sin\beta}{\sin\gamma} F = \frac{\sin 33,69^\circ}{\sin 70,35^\circ} F = 0,589\,F}$$

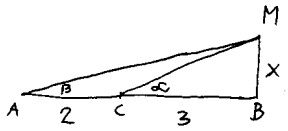
További feladatok részletes megoldással:

Adjuk meg a reakcióerők nagyságát és irányát!



$F = 100\ N$
$\alpha = 30^\circ$
$F_A = ?$
$F_B = ?$





$\beta = ?$

1.) $F\cos\alpha = F_A\cos\beta$

2.) $F\sin\alpha = F_B + F_A\sin\beta$

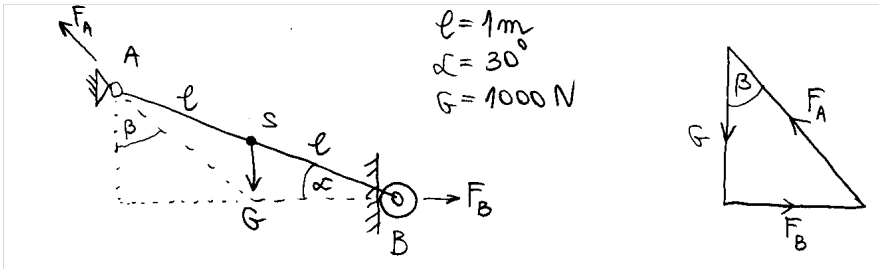
$\operatorname{tg}\alpha = \frac{x}{3} \rightarrow x = 3\operatorname{tg}30^\circ = 3\frac{\sqrt{3}}{3} = \sqrt{3}$

$\operatorname{tg}\beta = \frac{x}{5} \rightarrow \beta = \operatorname{arctg}\frac{\sqrt{3}}{5} = 19{,}11^\circ$

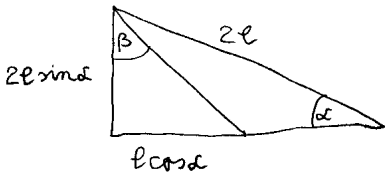
1.) $F_A = F\frac{\cos\alpha}{\cos\beta} = 100\frac{\cos 30^\circ}{\cos 19{,}11^\circ} = 91{,}65\ N$

2.) $F_B = F\sin\alpha - F_A\sin\beta = 100\sin 30^\circ - 91{,}65\sin 19{,}11^\circ = 20{,}00\ N$

Adjuk meg a reakcióerők nagyságát és irányát!



$\ell = 1\ m$
$\alpha = 30^\circ$
$G = 1000\ N$



$\operatorname{tg}\beta = \frac{\ell\cos\alpha}{2\ell\sin\alpha}$

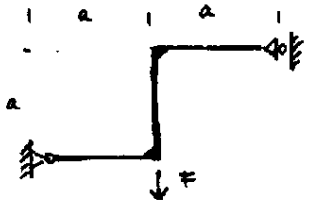
$\beta = \operatorname{arctg}\frac{1}{2\operatorname{tg}30^\circ} = 40{,}89^\circ$

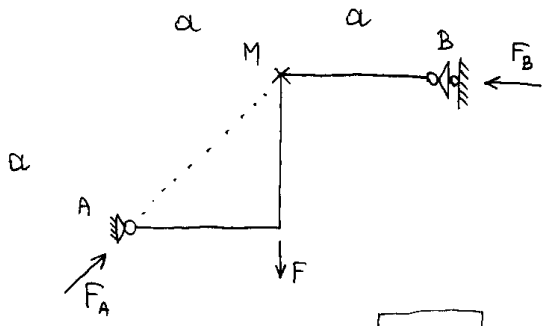
$\operatorname{tg}\beta = \frac{F_B}{G} \rightarrow F_B = G\operatorname{tg}\beta = 1000\operatorname{tg}40{,}89^\circ = 866N$

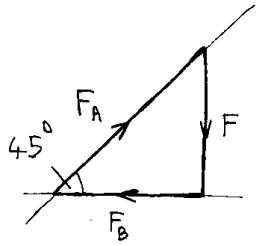
$\cos\beta = \frac{G}{F_A} \rightarrow F_A = \frac{G}{\cos\beta} = \frac{1000}{\cos 40{,}89^\circ} = 1323\ N$

Ez olyan, mint a munkafüzet 3.4. feladata:

Határozzuk meg a reakcióerők irányát és nagyságát!





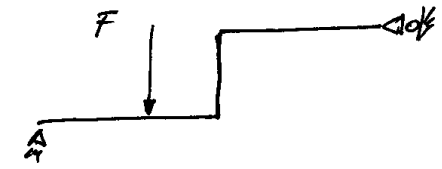


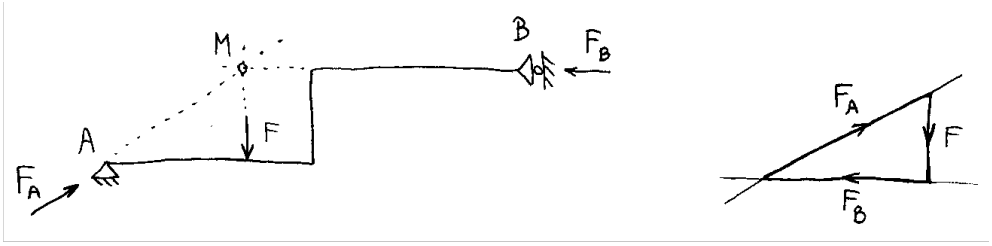
$F_B = F$

$F_A = \sqrt{2}\,F$

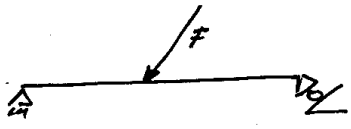
További feladatok megoldási vázlattal:

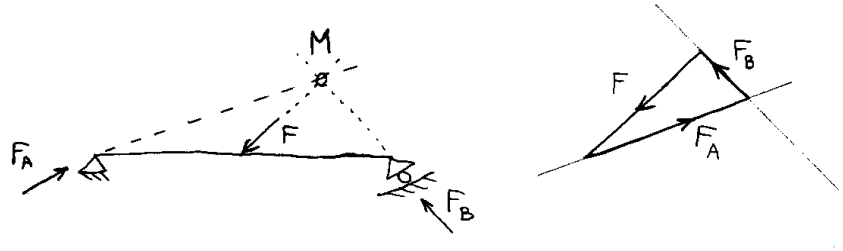
Adjuk meg a reakcióerők irányát és rajzoljuk meg a vektor-háromszöget!



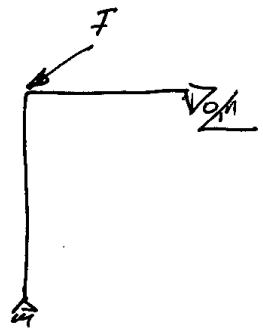


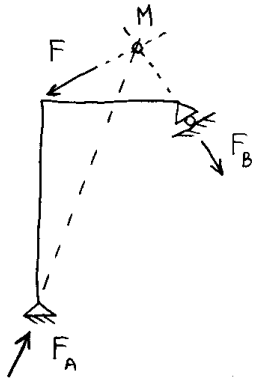
Adjuk meg a reakcióerők irányát és rajzoljuk meg a vektor-háromszöget!

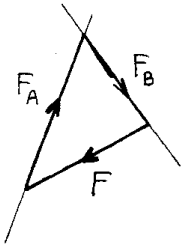




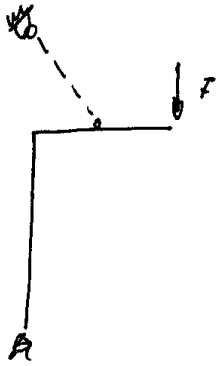
Adjuk meg a reakcióerők irányát és rajzoljuk meg a vektor-háromszöget!

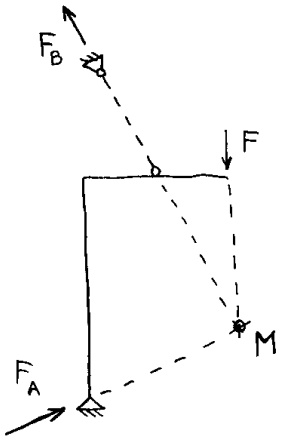


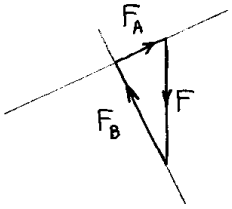




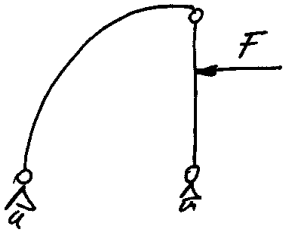
Adjuk meg a reakcióerők irányát és rajzoljuk meg a vektor-háromszöget!

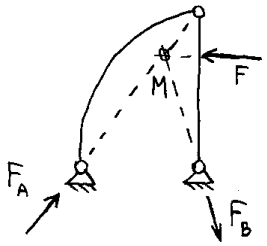


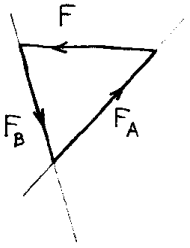




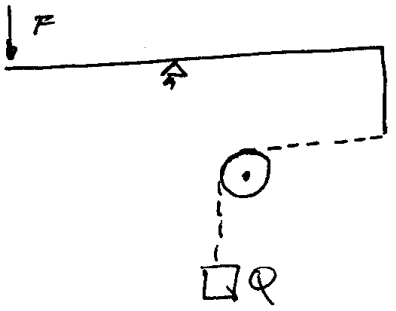
Adjuk meg a reakcióerők irányát és rajzoljuk meg a vektor-háromszöget!

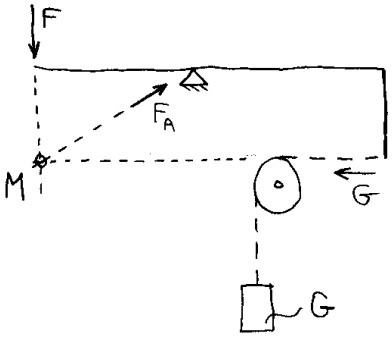


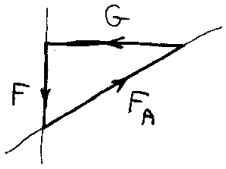




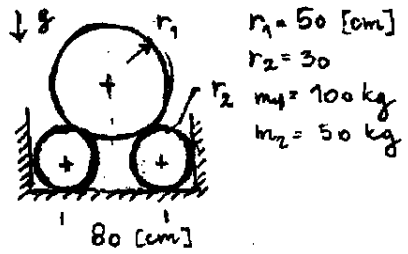
Adjuk meg a reakcióerők irányát és rajzoljuk meg a vektor-háromszöget!



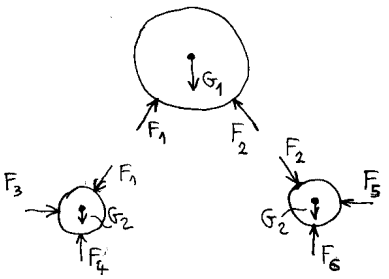


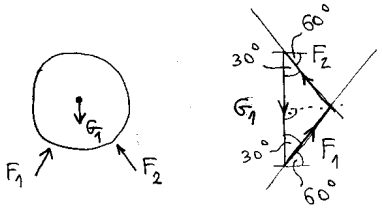


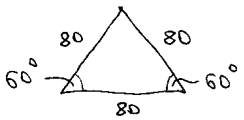
A 2010.03.04.-ei gyakorlaton áttekintett példa megoldása:
Határozzuk meg a reakcióerők irányát és nagyságát!



$r_1 = 50$ [cm]
$r_2 = 30$
$m_1 = 100$ kg
$m_2 = 50$ kg

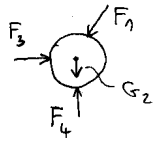


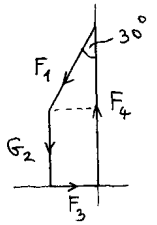




$$\frac{\frac{G_1}{2}}{F_1} = \cos 30^\circ \rightarrow \boxed{F_1 = \frac{G_1}{2\cos 30^\circ} = \frac{1000}{2\cos 30^\circ} = 577{,}4\ \text{N}}$$

Szimmetria: $\boxed{F_2 = F_1 = 577{,}4\ \text{N}}$





$$\frac{F_3}{F_1} = \sin 30^\circ \rightarrow \boxed{F_3 = F_1 \sin 30^\circ = 577{,}4 \cdot \frac{1}{2} = 288{,}7\ \text{N}}$$

$$\boxed{F_4 = G_2 + F_1 \cos 30^\circ = 500 + 577{,}4 \cos 30^\circ = 1000\ \text{N}}$$

Szimmetria: $F_5 = F_3$

$F_6 = F_4$