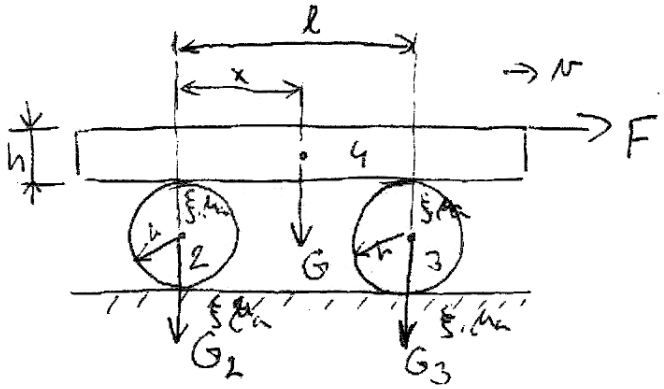


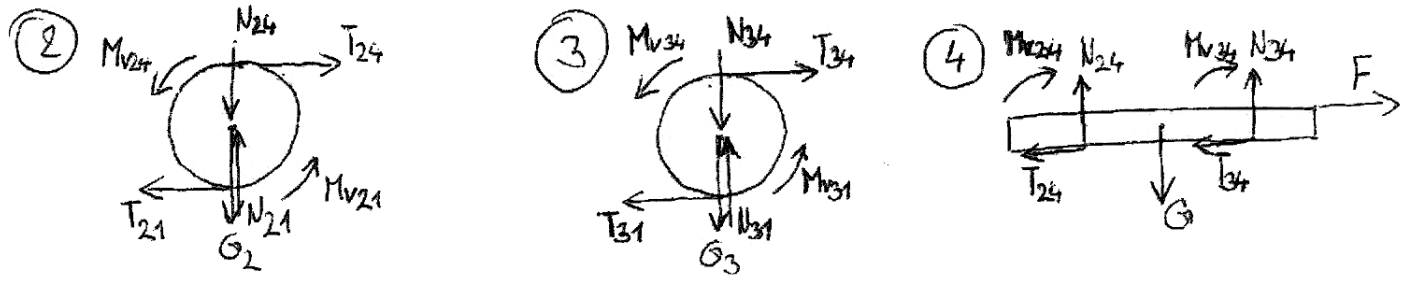
D: $G = 1000\,N$

$G_2 = G_3 = 300\,N$

$r = 100\,mm$; $l = 0{,}5\,m$; $h = 50\,mm$

$\xi = 4\,mm$, $\mu_k = 0{,}3$

U: $F = F(x)$



x: $T_{24} - T_{21} = 0$ $\qquad T_{34} - T_{31} = 0$ $\qquad F - T_{24} - T_{34} = 0$

y: $N_{21} - N_{24} - G_2 = 0$ $\qquad N_{31} - N_{34} - G_3 = 0$ $\qquad G - N_{24} - N_{34} = 0$

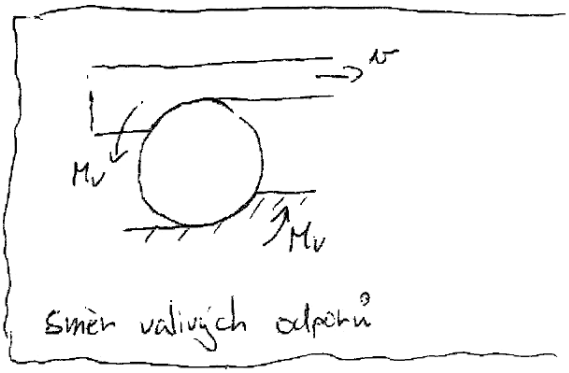
M: $M_{v21} + M_{v24} - T_{24} \cdot 2r = 0$ $\qquad M_{v31} + M_{v34} - T_{34} \cdot 2r = 0$ $\qquad N_{34} \cdot l - F \cdot h - G \cdot x - M_{v24} - M_{v34} = 0$

$M_{v21} = N_{21} \cdot \xi$

$M_{v24} = N_{24} \cdot \xi$

$M_{v31} = N_{31} \cdot \xi$

$M_{v34} = N_{34} \cdot \xi$



Vyjádření F obecně

$F = T_{24} + T_{34} = T_{21} + T_{31}$ (1)

$\left.\begin{array}{l} N_{21} - N_{24} - G_2 = 0 \\ N_{31} - N_{34} - G_3 = 0 \end{array}\right\} \oplus \quad (N_{21} + N_{31}) - (N_{24} + N_{34}) - (G_2 + G_3) = 0$ (2)

$\left.\begin{array}{l} N_{21}\xi + N_{24}\xi - T_{21} \cdot 2r = 0 \\ N_{31} \cdot \xi + N_{34} \cdot \xi - T_{31} \cdot 2r = 0 \end{array}\right\} \oplus \quad (N_{21} + N_{31}) \cdot \xi + (N_{24} + N_{34}) \cdot \xi - (T_{21} + T_{31}) \cdot 2r = 0$ (3)

$G = N_{24} + N_{34}$ (4)

(4), (2) $\Rightarrow (N_{21} + N_{31}) - G - (G_2 + G_3) = 0 \Rightarrow N_{21} + N_{31} = G + G_2 + G_3$ (5)

(4), (3), (1) $\Rightarrow (N_{21} + N_{31}) \cdot \xi + G \cdot \xi - F \cdot 2r = 0$ (6)

(5), (6) $\Rightarrow G \cdot \xi + G_2 \cdot \xi + G_3 \cdot \xi + G \cdot \xi - F \cdot 2r = 0$

$$\Rightarrow F = \frac{\xi \cdot (2G + G_2 + G_3)}{2 \cdot r} = \frac{0{,}004\,(2 \cdot 1000 + 300 + 300)}{2 \cdot 0{,}1} = 52\ N$$