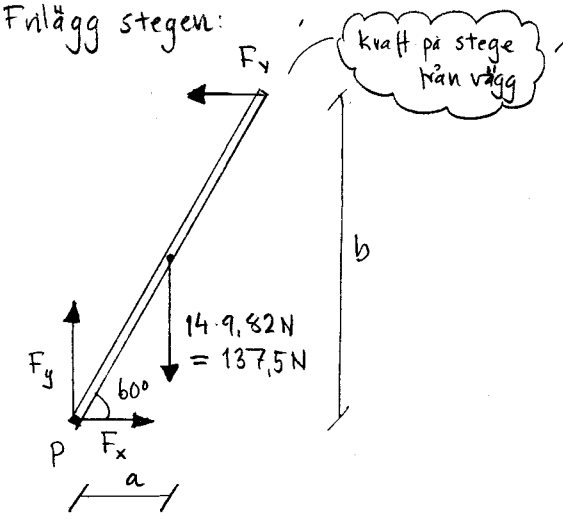
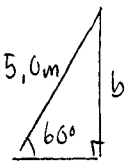
4.40

Frilägg stegen:

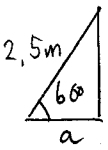


måste vara horisontell eftersom väggen friktionsfri



$$\sin 60° = \frac{b}{5{,}0\,m}$$

$$\Rightarrow b = 5{,}0\,m \cdot \sin 60° = 4{,}33\,m$$



$$\cos 60° = \frac{a}{2{,}5\,m}$$

$$\Rightarrow a = 2{,}5\,m \cdot \cos 60° = 1{,}25\,m$$

(Utan att sätta in siffror:

Momentpunkt P

$\overrightarrow{M} = F_g \cdot \frac{l}{2} \cdot \cos\alpha$ $\quad$ $\overrightarrow{M} = 137{,}5\,N \cdot 1{,}25\,m = 171{,}9\,Nm$

$\overleftarrow{M} = F_v \cdot l \cdot \sin\alpha$ $\quad$ $\overleftarrow{M} = F_v \cdot 4{,}33\,m$

Momentjämvikt ($\overrightarrow{M} = \overleftarrow{M}$) ger

$F_v = \frac{F_g}{2} \frac{1}{\tan\alpha}$ $\quad$ $F_v \cdot 4{,}33\,m = 171{,}9\,Nm \Rightarrow F_v = \frac{171{,}9}{4{,}33}\,N = 39{,}69\,N$

Kraftjämvikt ger nu

$F_y = F_g$ $\quad$ $F_y = 137{,}5\,N$

$F_x = F_v = \frac{F_g}{2} \frac{1}{\tan\alpha}$ $\quad$ $F_x = F_v = 39{,}69\,N$

Friktionstalet fås ur

$\mu = \frac{F_x}{F_y} = \frac{1}{2} \frac{1}{\tan\alpha}$) $\quad$ $\mu = \frac{F_x}{F_y} = \frac{39{,}69}{137{,}5} = 0{,}29$

Svar: 0,29