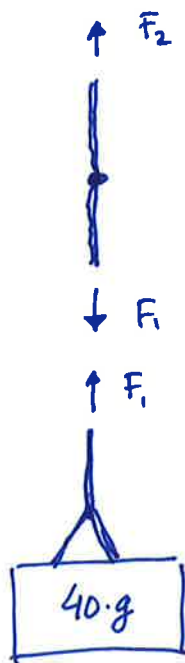


1 a) b) Innan man drar :



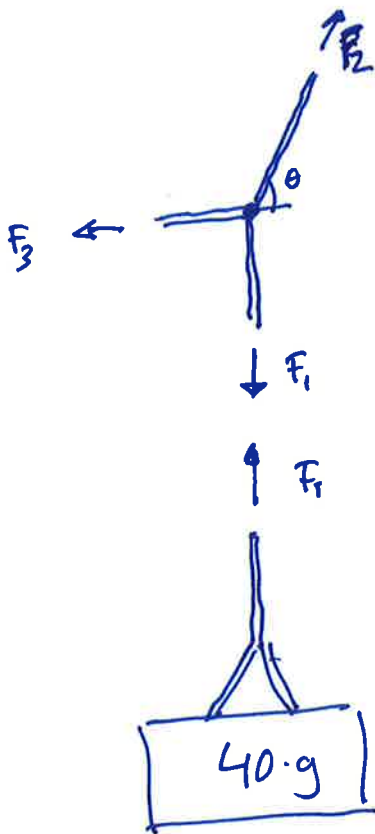
$$\uparrow: F_2 - F_1 = 0$$

$$F_2 = F_1$$

$$\uparrow F_1 - 40 \cdot g = 0$$

$$F_1 = 40 \cdot g$$

Om man drar



$$\uparrow F_2 \cdot \sin \theta - F_1 = 0 \quad (1)$$

$$\rightarrow F_2 \cdot \cos \theta - F_3 = 0$$

$$\uparrow: F_1 - 40 \cdot g = 0 \quad (2)$$

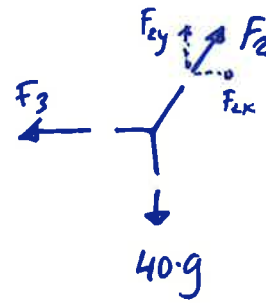
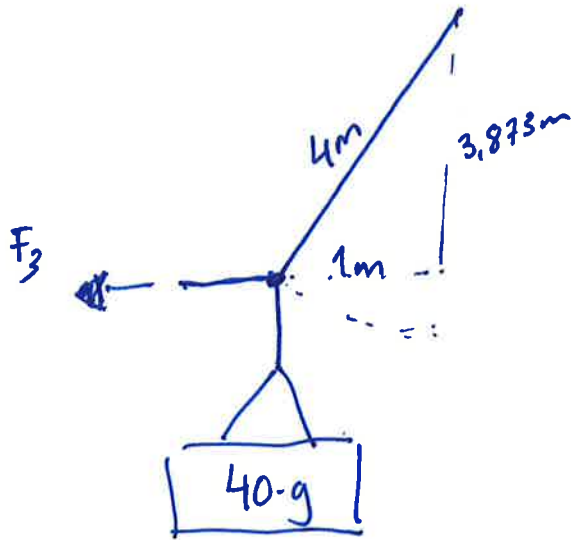
$$F_1 = 40 \cdot g$$

(1) $\Rightarrow F_2 = \frac{F_1}{\sin \theta}$ Dvs $F_2 > F_1$ eftersom $\theta \leq 90^\circ$ och $\sin \theta \leq 1$

(2) $\Rightarrow F_1$ är oförändrad. Svar: a) F_2 ökar
b) oförändrad

1 c)

s2.17



$$\uparrow: F_{2y} - 40 \cdot g = 0$$

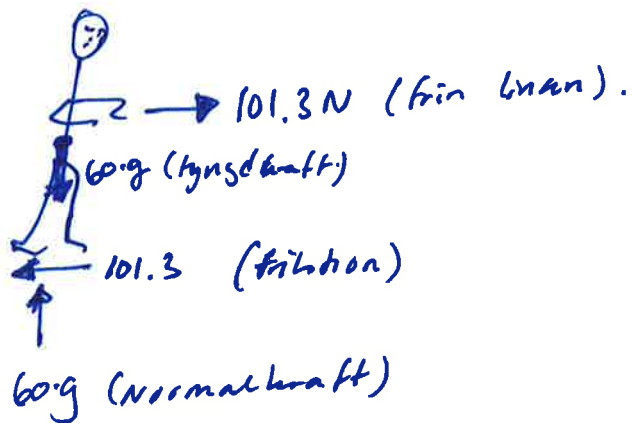
$$F_{2y} = 40 \cdot g = 392.4 \text{ N}$$

$$\rightarrow -F_3 + F_{2x} = 0$$

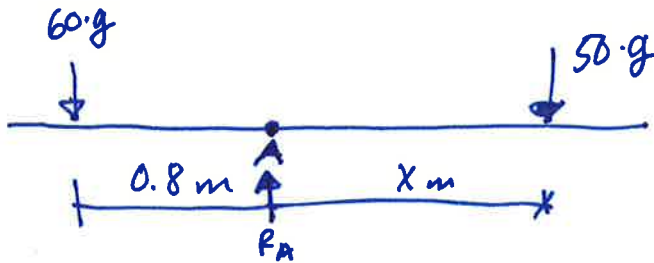
$$F_{2x} = F_3$$

$$\frac{F_{2x}}{1} = \frac{F_{2y}}{3.873} \Rightarrow F_{2x} = F_{2y} \cdot \frac{1}{3.873} = 392.4 \cdot \frac{1}{3.873} = \underline{\underline{101.3 \text{ N}}}$$

1 d)



2a)



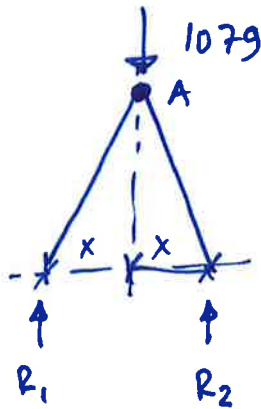
Momentjämvikt kring A.

$$\begin{aligned} \curvearrowleft_A: \quad 50 \cdot g \cdot x - 60 \cdot g \cdot 0.8 &= 0 & \Rightarrow & \quad x = \frac{60 \cdot g \cdot 0.8}{50 \cdot g} = \\ & & & \quad = \underline{\underline{0.96 \text{ m}}} \end{aligned}$$

b) Vertikal jämvikt

$$\uparrow: \quad -60g - 50g + R_A = 0 \Rightarrow R_A = 110 \cdot g = \underline{\underline{1079 \text{ N}}}$$

c)



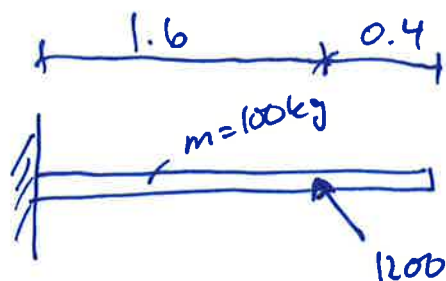
$$\begin{aligned} \curvearrowleft_A: \quad R_1 \cdot x - R_2 \cdot x &= 0 \\ x \cdot (R_1 - R_2) &= 0 \\ (x \neq 0) &\Rightarrow R_1 - R_2 = 0 \\ &\Rightarrow \underline{\underline{R_1 = R_2}} \end{aligned}$$

$$\uparrow: \quad R_1 + R_2 - 1079 = 0$$

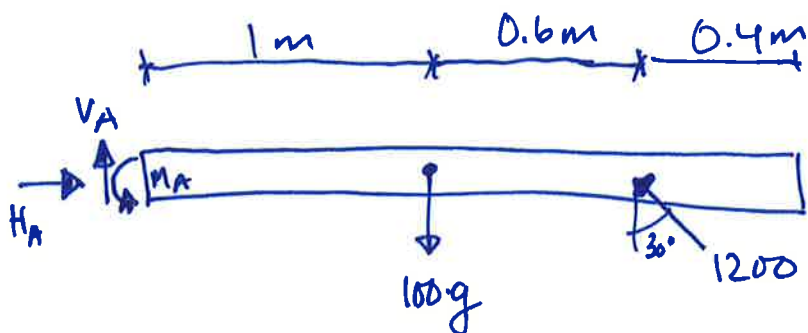
$$R_1 + R_2 = 1079 \quad \Rightarrow$$

$$\begin{aligned} R_1 + R_1 &= 1079 & R_1 &= 1079/2 = \\ & & &= \underline{\underline{539.5 \text{ N}}} \\ & & &= R_2 \end{aligned}$$

3)



Frläggning

Jämnikt

$$\uparrow: V_A - 100 \cdot g + 1200 \cdot \cos 30^\circ = 0 \quad V_A = -\underline{\underline{58.2 \text{ N}}}$$

$$\rightarrow: H_A - 1200 \cdot \sin 30^\circ = 0 \quad H_A = \underline{\underline{600 \text{ N}}}$$

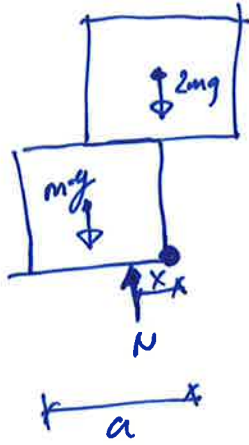
$$\curvearrow_A: -M_A + 100 \cdot g \cdot 1.0 - 1200 \cdot \cos 30^\circ \cdot 1.6 = 0$$

$$M_A = 100 \cdot g - 1200 \cdot \cos 30^\circ \cdot 1.6 = -\underline{\underline{681.8 \text{ Nm}}}$$

Svar: Reaktionskrakterna är 58.2 N (nedåt)
600 N (ät höger)

Momentet i inspänningen är 682 Nm (medurs)

4a)



$$\uparrow: N - 2mg - mg = 0$$

$$N = 3mg.$$

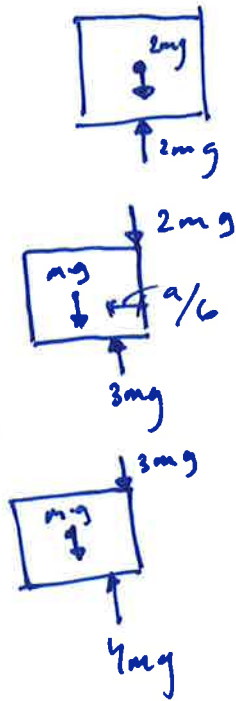
$$\curvearrowright: N \cdot x - m \cdot g \cdot \frac{a}{2} = 0$$

$$3m \cdot g \cdot x - m \cdot g \cdot \frac{a}{2} = 0$$

$$3x - \frac{a}{2} = 0$$

$$x = \frac{a}{2} \cdot \frac{1}{3} = \underline{\underline{\frac{a}{6}}}$$

b)



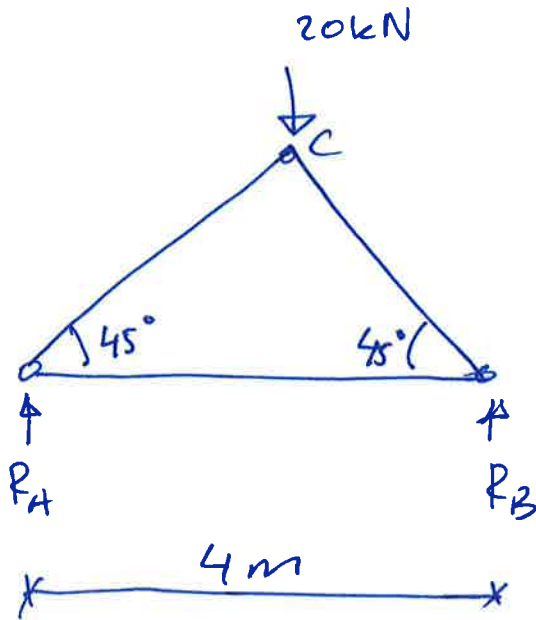
överst.

middlesta

understa.

5

56/7



$$\uparrow: -20 + R_A + R_B = 0$$

$$R_A + R_B = 20$$

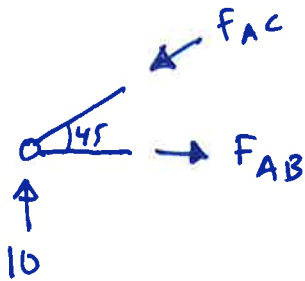
$$\curvearrowright_A: 20 \cdot 2 - R_B \cdot 4 = 0$$

$$R_B = \frac{20 \cdot 2}{4} = 10 \text{ (kN)}$$

$$R_A + R_B = 20 \Rightarrow$$

$$R_A = 20 - R_B = 20 - 10 = \underline{\underline{10 \text{ kN}}}$$

$$R_A = R_B = \underline{\underline{10 \text{ kN}}}$$



$$\uparrow: 10 - F_{AC} \sin 45^\circ = 0$$

$$F_{AC} = \frac{10}{\sin 45^\circ} = 14.1 \text{ kN}$$

$$\rightarrow F_{AB} - F_{AC} \cos 45^\circ = 0$$

$$F_{AB} = F_{AC} \cos 45^\circ = 14.1 \cdot \cos 45^\circ = \underline{\underline{10 \text{ kN}}}$$

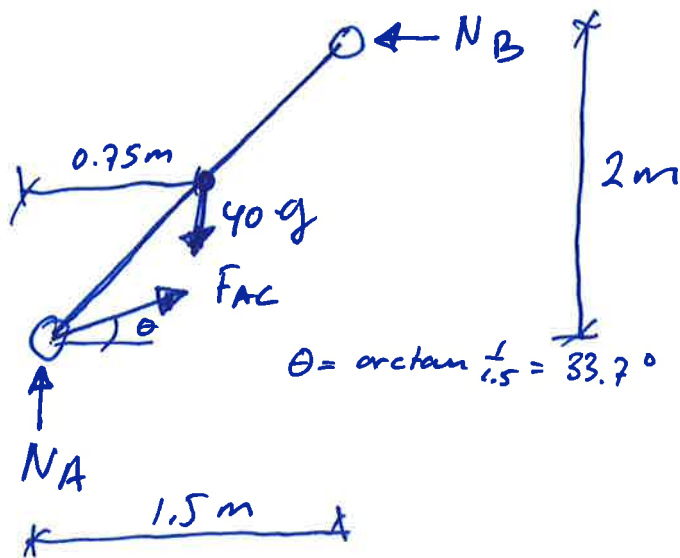
$$F_{AC} = 14.1 \text{ kN (tryck)}$$

$$F_{AB} = 10 \text{ kN (drag)}$$

$$F_{BC} = 14.1 \text{ kN (tryck)}$$

samma som F_{AC} pga symmetri!

6.)



$$\curvearrow A: 40 \cdot g \cdot 0.75 - N_B \cdot 2 = 0$$

$$N_B = 147.15 \text{ N}$$

$$\rightarrow: F_{AC} \cdot \cos 33.7^\circ - N_B = 0 \quad F_{AC} = 176.9 \text{ N}$$

$$\uparrow: -40 \cdot g + N_A + F_{AC} \cdot \sin 33.7^\circ = 0$$

$$N_A = 40 \cdot g - F_{AC} \cdot \sin 33.7^\circ = \underline{\underline{294.3 \text{ N}}}$$