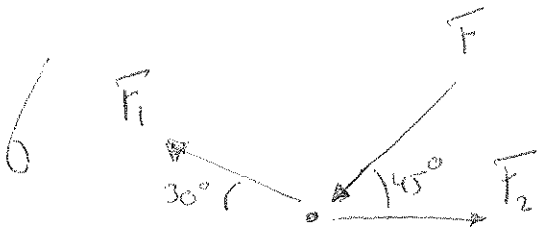


Opgave 1

analyse



gegeven: $F = 10 \text{ kN}$
 $F_1 = 14 \text{ kN}$
 $F_2 = 8 \text{ kN}$

gevraagd: Resultante R

planning

- ① F_1 ontbinden
- ② F ontbinden
- ③ $R_x = \dots$
- ④ $R_y = \dots$
- ⑤ $R = \sqrt{R_x^2 + R_y^2}$
 $\alpha = \dots$

uitvoeren

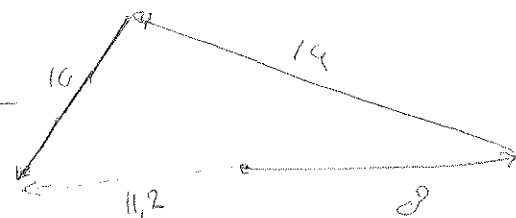
① $F_{1x} = F_1 \cdot \cos 30^\circ = 14 \cdot \frac{1}{2}\sqrt{3} = 12,1$
 $F_{1y} = F_1 \cdot \sin 30^\circ = 14 \cdot \frac{1}{2} = 7$

② $F_x = F \cdot \cos 45^\circ = 10 \cdot \frac{1}{2}\sqrt{2} = 7,1$
 $F_y = F \cdot \sin 45^\circ = 10 \cdot \frac{1}{2}\sqrt{2} = 7,1$

③ $R_x = -F_{1x} + F_2 - F_x = -12,1 + 8 - 7,1 = -11,2$

④ $R_y = F_{1y} - F_y = 7 - 7,1 = -0,1$

⑤ $R = \sqrt{11,2^2 + 0,1^2} = 11,2 \text{ kN}$
 $\tan \alpha = \frac{0,1}{11,2} \Rightarrow \alpha =$

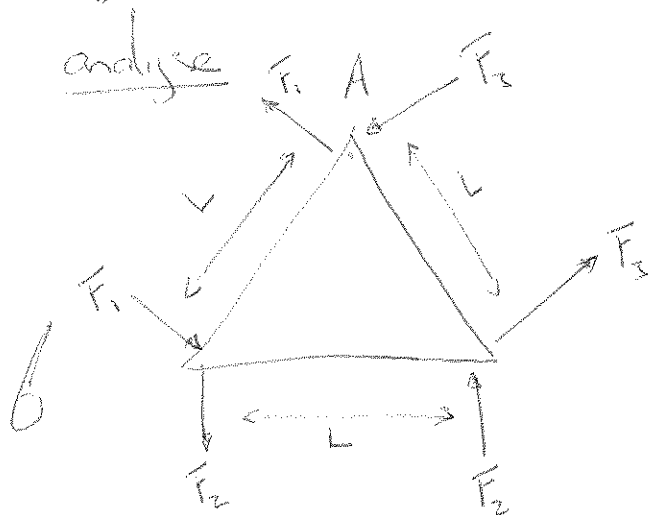


Evaluatie

lykt te kloppen!

Opdrave 2

analyse



gegeven:

$$L = 0,4 \text{ m}$$

$$F_1 = 200 \text{ N}$$

$$F_2 = 300 \text{ N}$$

$$F_3 = 150 \text{ N}$$

gevraagd:

Resultierend koppel: M_R

planning

$$\textcircled{1} M_1 = F_1 \cdot L$$

$$\textcircled{2} M_2 = F_2 \cdot L$$

$$\textcircled{3} M_3 = F_3 \cdot L$$

$$\textcircled{4} M_R = M_1 + M_2 + M_3$$

uitvoering

$$\textcircled{1} M_1 = 200 \cdot 0,4 = 80 \text{ Nm}$$

$$\textcircled{2} M_2 = 300 \cdot 0,4 = 120 \text{ Nm}$$

$$\textcircled{3} M_3 = 150 \cdot 0,4 = 60 \text{ Nm} +$$

$$\textcircled{5} M_R = M_1 + M_2 + M_3 = 260 \text{ Nm} \quad (+?)$$

evaluatie

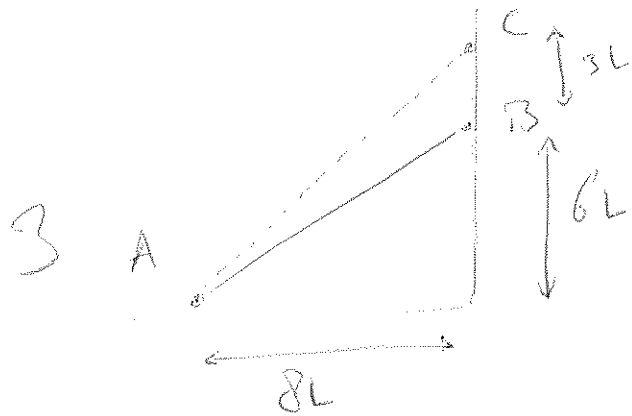
$$\sum M_A^{\text{op}}: M_R = F_1 \cdot L + F_2 \cdot \frac{1}{2}L + F_2 \cdot \frac{1}{2}L + F_3 \cdot L$$

$$= 200 \cdot 0,4 + 300 \cdot 0,2 + 300 \cdot 0,2 + 150 \cdot 0,4 = 260 \text{ Nm}$$

4

Opgave 3

analyse



gegeven:

$$m_{AB} = 30 \text{ kg}$$

$$L = 0,2 \text{ m}$$

gevraagd:

$$R_A$$

$$R_B$$

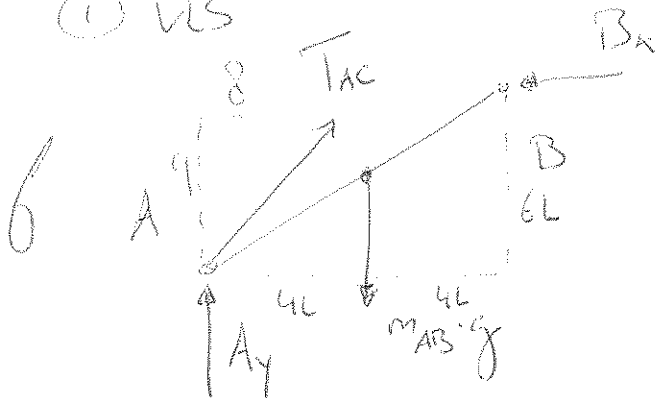
$$T_{AC}$$

Planning

- 1) VLS
- 2) EV opstellen
- 3) EV oplossen

uitvoering

1) VLS



2) EV

$$\sum F_x \rightarrow^+ : 0 = -B_x + \frac{8}{\sqrt{8^2+6^2}} \cdot T_{AC}$$

$$\sum F_y \uparrow^+ : 0 = A_y + \frac{6}{\sqrt{8^2+6^2}} \cdot T_{AC} - m_{AB} \cdot g$$

$$\sum M_A \curvearrowright : 0 = -4L \cdot m_{AB} \cdot g + B_x \cdot 6L$$

$$\sum M_A \Rightarrow B_x = \frac{2}{3} m_{AB} \cdot g = \underline{196,2 \text{ N}}$$

$$\sum F_x \Rightarrow T_{AC} = \frac{1}{8} \sqrt{8^2+6^2} \cdot B_x = \underline{295,3 \text{ N}}$$

$$\Sigma F_y \Rightarrow A_y = -\frac{g}{\sqrt{8^2+9^2}} T_{AC} + m_{AB} \cdot g$$

$$= -\frac{g}{\sqrt{8^2+9^2}} \cdot \cancel{2953} +$$

$$\frac{1}{8} \sqrt{8^2+9^2} \cdot B_x + m_{AB} \cdot g$$

$$= -\frac{g}{8} \cdot \cancel{196} \cdot \frac{2}{3} \cdot m_{AB} \cdot g + m_{AB} \cdot g$$

$$= +\frac{81}{4} m_{AB} \cdot g = \frac{177}{4} \cdot 30 \cdot 9,81 = \underline{\underline{73,6 \text{ N}}}$$

6 10

evaluatie

$$6 \quad \Sigma M_c^{(+)} \quad 0 = -A_y \cdot 8L - B_x \cdot 3L + m_{AB} \cdot g \cdot 4L$$

$$0 = -\frac{515}{73,6} \cdot 8 \cdot 0,2 - 196,2 \cdot 3 \cdot 0,2 + 30 \cdot 9,81 \cdot 4 \cdot 0,2$$

ok