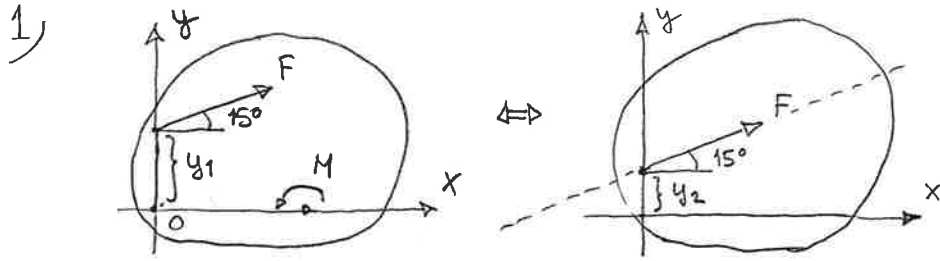


# Lösningar Seminariepass 8



$$\left\{ \begin{array}{l} (\rightarrow) \Sigma F_x = F \cos 15^\circ \\ (\uparrow) \Sigma F_y = F \sin 15^\circ \\ \circlearrowleft \Sigma M_o = F \cos 15^\circ \cdot y_1 - M = \\ = 57 \cdot 0.966 \cdot 0.8 - 46 = \\ = -1.95 \text{ Nm} \end{array} \right. \Leftrightarrow \left\{ \begin{array}{l} (\rightarrow) F \cos 15^\circ \\ (\uparrow) F \sin 15^\circ \\ \circlearrowleft F \cdot \cos 15^\circ \cdot y_2 = \\ = 55.06 \cdot y_2 \end{array} \right.$$

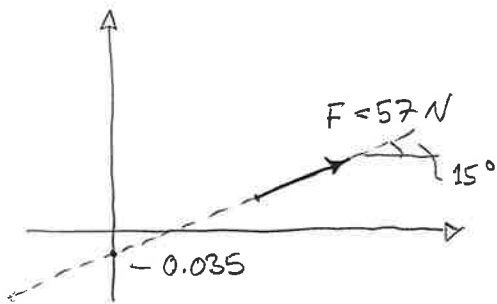
Samma momentverkan i båda fallen  $\Rightarrow$

$$-1.95 = 55.06 \cdot y_2 \quad ; \quad y_2 = -0.035$$

Linjens riktningskoeff.  $k = \tan 15^\circ = 0.27$

Alltså  $y = 0.27x - 0.035$  (i meter)

Dvs



Samma kraftverkan och samma momentverkan.

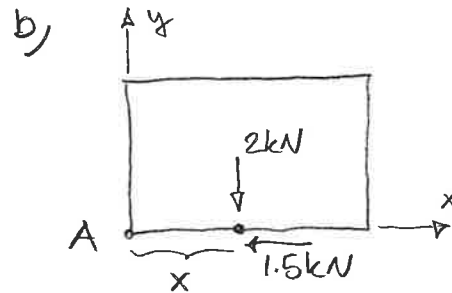
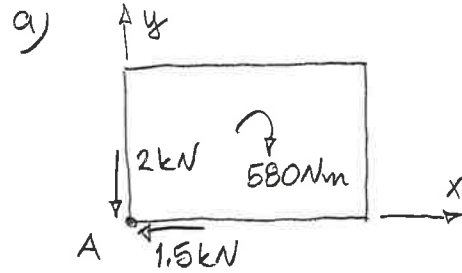
2)

$$R_x = \Sigma F_x = 1.5 - 3 = -1.5 \text{ kN}$$

$$R_y = \Sigma F_y = -2 \text{ kN}$$

$$\overset{\curvearrowright}{\Sigma} M = 1500 \cdot 0.2 + 2000 \cdot 0.5 - 3000 \cdot 0.3 + 100 + 80 = 580 \text{ Nm}$$

Alltså



a)  $\Leftrightarrow$  b)  $\Rightarrow \overset{\curvearrowright}{\Sigma} M = 580 \text{ Nm} = 2000 \cdot x$ ;

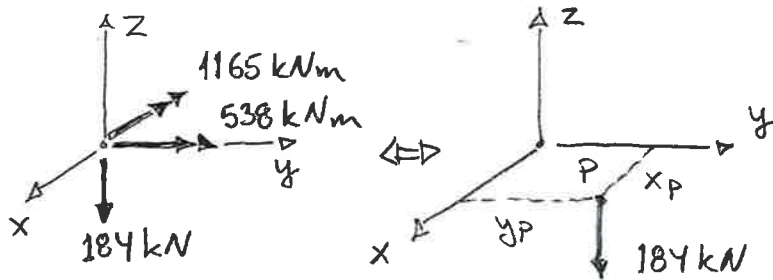
$$x = 0.29 \text{ m}$$

$$3) R_z = 64 - 48 - 56 - 40 - 32 - 72 = -184 \text{ kN}$$

Moment map x- och y-axlarna:

$$\begin{aligned} \sum M_x &= 64 \cdot 2.4 - 32 \cdot 6 - 56 \cdot 8.8 - 72 \cdot 8.8 = \\ &= -1165 \text{ kNm} \end{aligned}$$

$$\begin{aligned} \sum M_y &= 48 \cdot 8 + 56 \cdot 8 - 64 \cdot 6 + 32 \cdot 2.8 = \\ &= 538 \text{ kNm} \end{aligned}$$



Samma moment map x- och y-axlarna i båda fallen:

$$1165 = y_p \cdot 184 \quad ; \quad y_p = \underline{\underline{6.33 \text{ m}}}$$

$$538 = x_p \cdot 184 \quad ; \quad x_p = \underline{\underline{2.92 \text{ m}}}$$