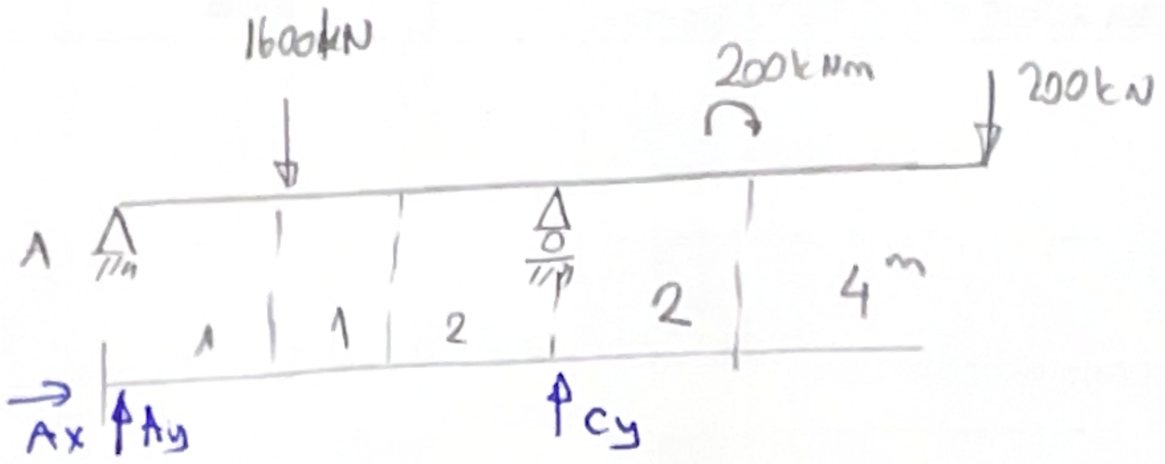
① 

$\Sigma M_A = 0$

$-1600.1 + C_y.4 - 200 - 200.10 = 0$

$-1600 - 200 - 2000 = -4C_y \Rightarrow 4C_y = 3800\,kN$

$\boxed{C_y = 950N}$

$\Sigma F_y = 0$

$A_y + C_y = 1600 + 200 \Rightarrow A_y = 1800 - 950 \Rightarrow \boxed{A_y = 850N}$

$\Sigma F_x = 0$

$\boxed{A_x = 0\,N}$

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② $A(0,0,5)$
$B(0,3,0)$
$C(6,3,0)$

$\vec{F_{AB}} = |F_{AB}| \cdot \vec{U_{AB}}$

$\vec{AB} = 0\vec{i} + 3\vec{j} - 5\vec{k}$

$|AB| = \sqrt{9+25} = \sqrt{34} = 5,83$

$\vec{U_{AB}} = \frac{3}{5,83}\vec{j} - \frac{5}{5,83}\vec{k}$

$\vec{F_{AB}} = 200.\left[\frac{3}{5,83}\vec{j} - \frac{5}{5,83}\vec{k}\right]$

$\vec{F_{AB}} = 102,9\vec{j} - 171,5\vec{k}$

$\vec{F_{AC}} = |F_{AC}| \cdot \vec{U_{AC}}$

$\vec{AC} = 6\vec{i} + 3\vec{j} - 5\vec{k}$

$|AC| = \sqrt{6^2+3^2+5^2} = \sqrt{70} = 8,3$

$\vec{U_{AC}} = \frac{6}{8,3}\vec{i} + \frac{3}{8,3}\vec{j} - \frac{5}{8,3}\vec{k}$

$\vec{F_{AC}} = 120.\left[\frac{6}{8,3}\vec{i} + \frac{3}{8,3}\vec{j} - \frac{5}{8,3}\vec{k}\right]$

$\vec{F_{AC}} = 86,7\vec{i} + 43,3\vec{j} - 72,2\vec{k}$ //

$\vec{R} = \vec{F_{AC}} + \vec{F_{AB}} = 86,7\vec{i} + 146,2\vec{j} - 243,7\vec{k}$ //

$|R| = \sqrt{(86,7)^2 + (146,2)^2 + (-243,7)^2} = 297,1\,kN$

b) $\cos\alpha = \frac{86,7}{297,1} \Rightarrow \alpha = 73°$

$\cos\beta = \frac{146,2}{297,1} \Rightarrow \beta = 60,5°$

$\cos\gamma = -\frac{243,7}{297,1} \Rightarrow \gamma = 145,1°$

③

	x	y	A	xA	yA
▭	40	20	3200	128000	64000
◠	60	K 4815	L 600	36000	28100
⊖	60	50	M −19,6	−1176	−980
▭	30	10	−800	−24000	−8000
			2980 ΣA	138824 ΣxA	84120 ΣyA

$\frac{4r}{3\pi}$ ↓ ; $\bar{r}$ ↑

$$\bar{x} = \frac{\Sigma \bar{x} A}{\Sigma A}$$

$$\bar{x} = \frac{138824}{2980} = 46{,}15\ cm \;//$$

$$\bar{y} = \frac{\Sigma \bar{y} A}{\Sigma A} =$$

$$\bar{y} = \frac{84120}{2980} = 28{,}2\ cm \;//$$

$$K = 40 + \frac{4.20}{3.\pi} \cong 48{,}5$$

$$L = \frac{\pi r^2}{2} = \frac{3.20^2}{2} \cong 600$$

$$M = \pi r^2 = \pi.(2{,}5)^2 \cong 19{,}6$$

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④ $100.10 = 20.F \Rightarrow \boxed{F = 50\ N}$ //