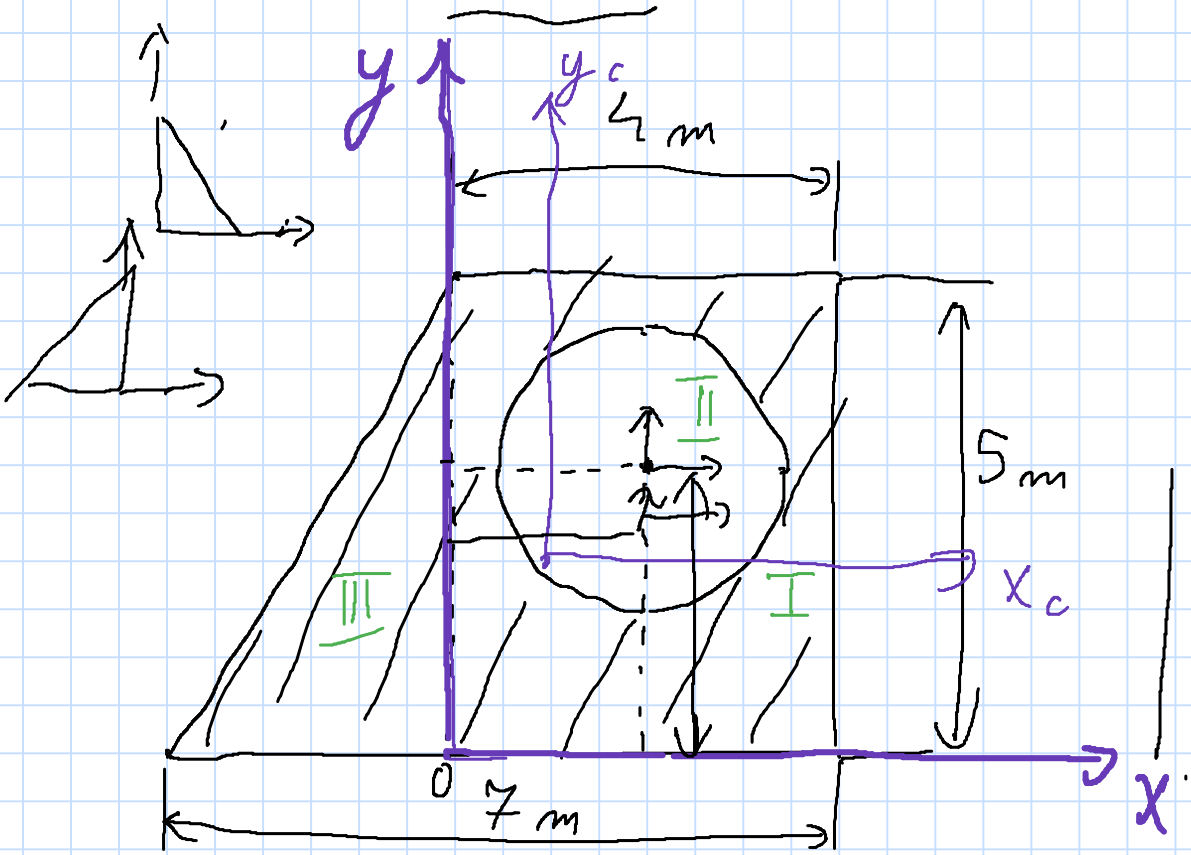
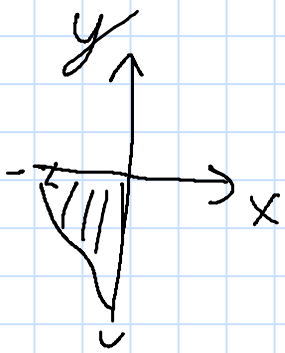


$\varrho = 4 \frac{kg}{m^2}$



Wyznaczyć mom główne centralne

$$x_c = \frac{\sum m_i \cdot x_i}{\sum m_i} \qquad y = \frac{\sum m_i y_i}{\sum m_i}$$

$$y = \frac{\sum A_i y_i}{\sum A_i}$$

Nr	x_i	y_i	A_i
I	2	2,5	20
II	2	3	7,1
III	-1	$\frac{5}{3}$	6

$40 - 14,2 - 6$

$$x_c = \frac{20 \cdot 2 - 7,1 \cdot 2 + 6 \cdot (-1)}{20 - 7,1 + 6} = \frac{19,8}{18,9} \simeq 1$$

$50 - 21,3 + 10$

$$y_c = \frac{20 \cdot 2,5 - 7,1 \cdot 3 + 6 \cdot \frac{5}{3}}{20 - 7,1 + 6} = \frac{38,7}{18,9} \simeq 2,05$$

$$J_x = J_x^{I} - J_x^{II} + J_x^{III}$$

$$J_y = J_y^{I} - J_y^{II} + J_y^{III}$$

$$D_{xy} = D_{xy}^{I} - D_{xy}^{II} + D_{xy}^{III}$$

$$J_x^{I} =$$

$$J_x = \frac{b_I h_I^3}{3} - \underbrace{\frac{\pi R^4}{4}}_{J_x^{II}} + \pi R^2 \cdot 3^2 + \frac{b_{III} h_{III}^3}{12}$$

$$J_y =$$

$$D_{xy}^{I}$$

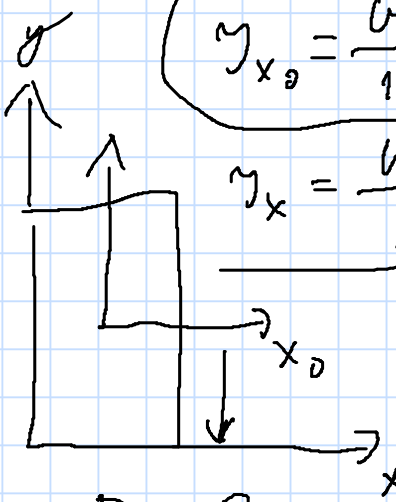
$$D_{x_0 y_0} = 0 + 20 \cdot 2{,}5 \cdot 2 - (0 + 7{,}1 \cdot 3 \cdot 2) + - \frac{b_{III}^2 h_{III}^2}{24}$$

$$J_{x_c} = J_x - 18{,}9 \cdot 2{,}05^2$$

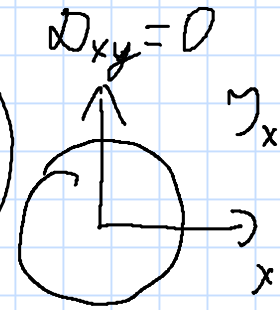
$$D_{xy} = -\frac{b^2 h^2}{4}$$

$$D_{x_0 y_0} = 0$$

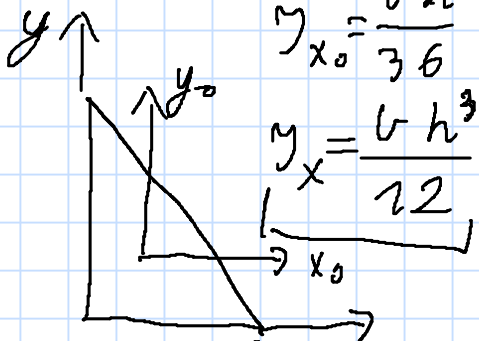
$$J_{x_0} = \frac{b h^3}{12}$$



$$J_x = \frac{b h^3}{3}$$



$$J_x = \frac{\pi R^4}{4}$$



$$J_{x_0} = \frac{b h^3}{36}$$

$$J_x = \frac{b h^3}{12}$$

$$J_{xy}^{\Delta} = \frac{b^2 h^2}{24}$$

$$y_{y_c} = y_y - 18{,}9 \cdot 1^2$$

$$D_{x_c y_c} = D_{xy} - 18{,}9 \cdot 2{,}05 \cdot 1$$