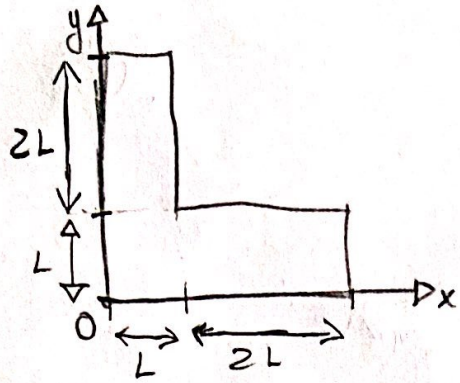
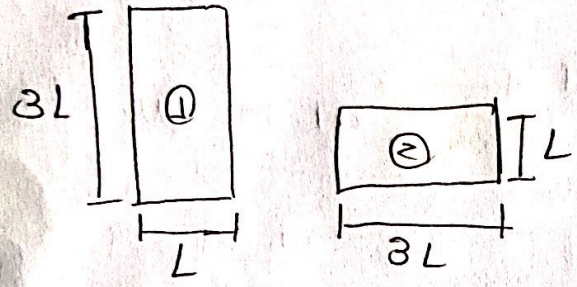
Questão 1



$$J_z = \frac{A}{6}\sigma L^4$$

$$J_{xy} = B\sigma L^4$$

$$J_x = C\sigma L^4$$



$$J_z = \frac{1}{12}m(b^2+c^2)$$

$$J_{z_1} = J_{\bar{z}_1} + m\left[\left(\frac{L}{2}\right)^2 + \left(\frac{3L}{2}\right)^2\right] = \frac{1}{12}m(L^2+3L^2) + m\left(\frac{L^2}{4}+\frac{9L^2}{4}\right)$$

$$= \gamma\frac{3L^2}{12}(L^2+3L^2) + \sigma\, 3L^2\left(\frac{10L^2}{4}\right) = \frac{\sigma 5L^4}{2} + \frac{\sigma 15L^4}{2}$$

$$J_{z_1} = \sigma\, 10\, L^4$$

$$J_{z_2} = \frac{1}{12}m\cdot\left[(2L)^2 + L^2\right] + m\left(\frac{L^2}{4}+4L^2\right)$$

$$= \sigma\frac{2L^2}{12}\left(4L^2+L^2\right) + \sigma\cdot 2L^2\left(\frac{L^2}{4}+4L^2\right) = \sigma\frac{5L^4}{6} + \frac{17L^4}{2}\sigma$$

$$= \frac{28L^4}{3}\gamma$$

$$J_z = \frac{28L^4}{3}\gamma + 10L^4$$

$$J_z = \frac{116}{6}L^4\sigma$$

↳ **A = 116**

$$J_{xy_1} = \cancel{J_{xy_1}} + m_1 \bar{x}_1 \bar{y}_1 = \sigma 3L^2 \cdot \frac{L}{2} \cdot 3L = \frac{9}{4} L^2 \sigma$$

$$J_{xy_2} = \cancel{J_{xy_2}} + m_2 \bar{x}_2 \bar{y}_2 = \sigma 2L^2 \cdot 2L \cdot \frac{L}{2} = 2L^4 \sigma$$

$$J_{xy} = \frac{9}{4} L^4 \sigma + 2L^4 \sigma = \frac{17}{4} \sigma L^4$$

$$\boxed{B = 4{,}25}$$

$$J_{xz_1} = \cancel{J_{xz_1}}^{0} + m_1 \bar{x}_1 \cancel{\bar{z}_1}^{0} = 0$$

$$J_{xz_2} = \cancel{J_{xz_2}} + m_2 \bar{x}_2 \cdot \cancel{\bar{z}_2}^{0} = 0$$

$$J_{xz} = J_{xz_1} + J_{xz_2}$$

$$J_{xz} = 0$$

$$\boxed{C = 0}$$

Questão 3

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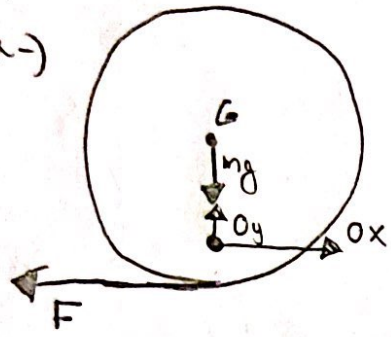
a-)



b-) $\sum M_o = J_o \ddot{\alpha}$

$F(R-e) = m(R^2 - 2e^2)\alpha$

$$\vec{\alpha} = \frac{-F(R-e)\vec{k}}{m\left(\frac{R^2}{2} + e^2\right)}$$

$J_o = J_G + m\left(\overline{J_G}\right)^2$

$J_o = \frac{mR^2}{2} + m(e)^2$

c-) $\omega = 0$

$\sum F_y = m\overset{0}{a_{Gy}}$

$O_y - mg = 0$

$O_y = mg$

$\sum F_x = m a_{Gx}$

$O_x - F = \frac{m F(R-e)e}{m\left(\frac{R^2}{2} + e^2\right) - e)}$

$$O_x = \frac{F(R-e)e}{(R^2/2 + e^2)} + F$$

$\vec{a}_G = \vec{a}_O + \vec{\alpha} \wedge (G-O) - \omega^2(G-O)$

$\vec{a}_g = \frac{F(R-e)e\vec{u}}{m\left(\frac{R^2}{2} + e^2\right)}$