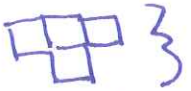
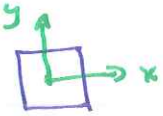
Moment of Inertia Tensor of "T"



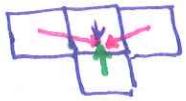
lone square: 

$$I_{11} = \sigma \int_{-q/2}^{q/2}\int y^2\,dx\,dy = \sigma q \left.\frac{y^3}{3}\right|_{-q/2}^{q/2} = \frac{\sigma q^4}{12} = \frac{Mq^2}{12}$$

$I_{22} = I_{11}$; $I_{33} = 2 * I_{11}$; off diagonal $= 0$

$$I = \frac{Mq^2}{12}\begin{pmatrix} 1 & & \\ & 1 & \\ & & 2 \end{pmatrix}$$

$$Y_{cm} = \frac{3\cdot\frac{q}{2} - \frac{q}{2}}{4} = \frac{q}{4}$$



$\vec{q}_1 = (0, -1/4)\,q$

$\vec{q}_2 = (0, 3/4)\,q$

$\vec{q} = (\pm 1, -1/4)\,q$

off set vectors:

$$I = Ma^2\left\{\frac{4}{12}\begin{pmatrix} 1 & & \\ & 1 & \\ & & 2 \end{pmatrix} + \sum\left[\mathbb{1}\,\vec{q}_i^{\,2} - \vec{q}_i\vec{q}_i\right]\right\}$$

$$\begin{pmatrix} 9/16 & & \\ & 0 & \\ & & 1/16 \end{pmatrix} + \begin{pmatrix} 9/16 & & \\ & 0 & \\ & & 9/16 \end{pmatrix} + 2\begin{pmatrix} 1/16 & & \\ & 1 & \\ & & \frac{17}{16} \end{pmatrix}$$

$$I_{11} = \frac{1}{3} + \frac{10}{16} + \frac{1}{8} = \frac{17}{12}$$

$$I_{22} = \frac{1}{3} + 2 = \frac{7}{3}$$

$$I_{33} = \frac{2}{3} + \frac{10}{16} + \frac{17}{8} = \frac{41}{12}$$