Find the rectangular moments of inertia for this shape about both the X and Y axes though the centroid. Leave the answer in terms of the generic width (b) and height (h) of the rectangle.

\[ I_{xx} = \int_{-h/2}^{h/2} (dy)(y^2) \]

\[ I_{xx} = \int_{-h/2}^{h/2} (b)(dy)(y^2) = \int_{-h/2}^{h/2} by^2 \, dy \]

\[ I_{xx} = \left[ \frac{1}{3} by^3 \right]_{-h/2}^{h/2} = \frac{h}{3} b y^3 \]
\[ I_{x'y'} = \frac{1}{24} bh^3 + \frac{1}{24} bh^3 \]

\[ I_{xx} = \frac{1}{12} bh^3 \]

\[ I_{yy} = \int_{-\frac{b}{2}}^{\frac{b}{2}} (dA)(x^2) \, dx \]

\[ I_{yy} = \int_{-\frac{b}{2}}^{\frac{b}{2}} (h)(x^2) \, dx = \left[ \frac{1}{2} (h)(x^3) \right]_{-\frac{b}{2}}^{\frac{b}{2}} \]

\[ I_{yy} = \frac{1}{3} h \left( \frac{b}{2} \right)^3 - \frac{1}{3} h \left( -\frac{b}{2} \right)^3 \]

\[ I_{yy} = \frac{1}{24} bh^3 + \frac{1}{24} bh^3 \]

\[ I_{yy} = \frac{1}{12} bh^3 \]