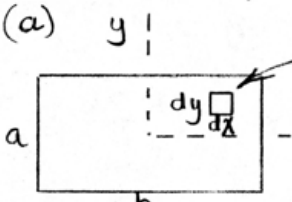
B/10 $m = \rho A = \rho ab$ (ρ = mass/area)

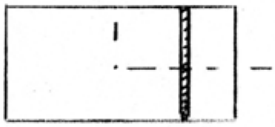
(a)



$$I_{xx} = \int (y^2 + z^2)^{\to 0}\, dm = \int_{-\frac{b}{2}}^{\frac{b}{2}} \int_{-\frac{a}{2}}^{\frac{a}{2}} y^2 \rho\, dy\, dx$$

$$= \rho \left(\tfrac{1}{12}a^3\right) \int_{-\frac{b}{2}}^{b/2} dx = \tfrac{1}{12}\rho a^3 b \left(\frac{m}{\rho ab}\right) = \underline{\tfrac{1}{12} m a^2}$$

(b)



$dm = \rho a\, dx$, $dI_{xx} = \frac{1}{12} dm (a^2)$

$$= \tfrac{1}{12}\rho a^3\, dx$$

$$I_{xx} = \int dI_{xx} = \int_{-b/2}^{b/2} \tfrac{1}{12}\rho a^3\, dx$$

$$= \tfrac{1}{12}\rho a^3 b \left(\frac{m}{\rho ab}\right) = \underline{\tfrac{1}{12} m a^2}$$

Note that method (b) <u>begins</u> in the <u>middle</u> of method (a). By inspection, $\underline{I_{yy} = \tfrac{1}{12} m b^2}$

$$I_{zz} = I_{xx} + I_{yy} = \underline{\tfrac{1}{12} m (a^2 + b^2)}$$