

SOLUTION OF HOMEWORK NO: ~~15~~

SOLUTION (10-1) (Textbook Page 505)

Area of the differential element (shaded)

$$dA = x dy \text{ where } x = b - \frac{b}{h}y,$$

$$\text{hence, } dA = x dy = (b - \frac{b}{h}y) dy$$

$$I_x = \int_A y^2 dA = \int_0^h y^2 (b - \frac{b}{h}y) dy$$

$$\Rightarrow I_x = \int_0^h (by^2 - \frac{b}{h}y^3) dy$$

$$\Rightarrow I_x = \left. \frac{b}{3}y^3 - \frac{b}{4h}y^4 \right|_0^h = \frac{bh^3}{12} = \frac{1}{12}bh^3.$$

