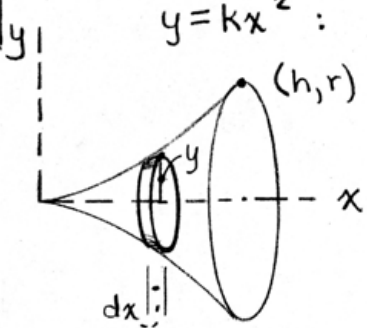


B/31



$y = kx^2 : r = kh^2 \Rightarrow k = \frac{r}{h^2}$
 $y = \frac{r}{h^2} x^2$
 $dm = \rho dV = \rho \pi y^2 dx$
 $dI_{xx} = \frac{1}{2} dm y^2$
 $= \frac{1}{2} \rho \pi y^4 dx$
 $= \frac{1}{2} \rho \pi \frac{r^4}{h^8} x^8 dx$

$$I_{xx} = \int dI_{xx} = \frac{1}{2} \rho \pi \frac{r^4}{h^8} \int_0^h x^8 dx = \frac{1}{18} \rho \pi r^4 h$$

The mass is $m = \rho V = \int_0^h \rho \pi y^2 dx$

$$= \int_0^h \rho \pi \frac{r^2}{h^4} x^4 dx = \frac{1}{5} \rho \pi r^2 h$$

So $I_{xx} = \frac{1}{18} \rho \pi r^4 h \left(\frac{m}{\frac{1}{5} \rho \pi r^2 h} \right) = \frac{5}{18} m r^2$