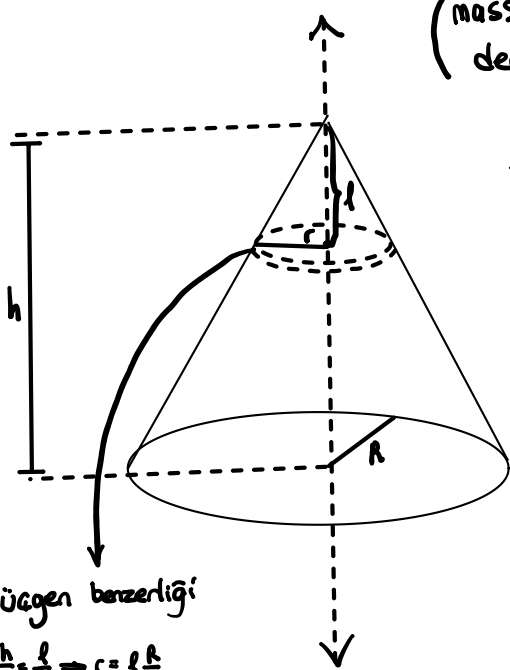


(mass density : ρ) $\left(\rho = \frac{M}{\frac{\pi R^2 h}{3}} \right)$

from the I of a uniform circle

$$\left. \begin{aligned} dI &= \frac{1}{2} dm r^2 = \frac{1}{2} \frac{R^2}{h^2} l^2 dm \\ dm &= \rho dV \end{aligned} \right\} dI = \frac{1}{2} \pi \rho \frac{R^4}{h^4} l^4 dl$$

$$dV = \pi r^2 dl = \pi \frac{R^2}{h^2} l^2 dl$$



üçgen benzerliği

$$\frac{h}{R} = \frac{l}{r} \Rightarrow r = l \frac{R}{h}$$

$$\int dI = \int_0^h \frac{1}{2} \pi \rho \frac{R^4}{h^4} l^4 dl = \frac{1}{2} \pi \rho \frac{R^4}{h^4} \frac{l^5}{5} \Big|_0^h = \frac{\pi \rho R^4 h}{10} = \frac{\pi R^4 h}{10} \frac{M}{\frac{\pi R^2 h}{3}} = \frac{3}{10} MR^2 = I$$