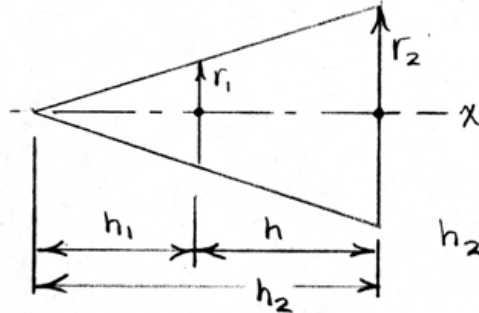


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② : Entire cone ; ① : "Missing" top



$$\frac{h_1}{r_1} = \frac{h_1 + h}{r_2}$$

$$h_1 = \frac{hr_1}{r_2 - r_1}$$

$$h_2 = h_1 + h = \frac{hr_1}{r_2 - r_1} + h = \frac{hr_2}{r_2 - r_1}$$

$$I_2 = \frac{3}{10} m_2 r_2^2 = \frac{3}{10} \left(\rho \frac{1}{3} \pi r_2^2 \frac{hr_2}{r_2 - r_1} \right) r_2^2 \quad \left(\begin{array}{l} \text{See} \\ \text{Table D/4} \end{array} \right)$$

$$= \frac{1}{10} \rho \pi \frac{hr_2^5}{r_2 - r_1}$$

$$I_1 = \frac{3}{10} m_1 r_1^2 = \frac{3}{10} \left(\rho \frac{1}{3} \pi r_1^2 \frac{hr_1}{r_2 - r_1} \right) r_1^2$$

$$= \frac{1}{10} \rho \pi \frac{hr_1^5}{r_2 - r_1}$$

$$\text{Frustum mass } m = \rho \frac{1}{3} \pi \left[r_2^2 \frac{hr_2}{r_2 - r_1} - r_1^2 \frac{hr_1}{r_2 - r_1} \right]$$

$$= \frac{1}{3} \rho \pi h \frac{r_2^3 - r_1^3}{r_2 - r_1}$$

$$\text{So } I = I_2 - I_1 = \frac{1}{10} \rho \pi h \frac{r_2^5 - r_1^5}{r_2 - r_1} \left(\frac{m}{\frac{1}{3} \rho \pi h \frac{r_2^3 - r_1^3}{r_2 - r_1}} \right)$$

$$= \frac{3}{10} m \frac{r_2^5 - r_1^5}{r_2^3 - r_1^3}$$