

$$\text{height of center of mass} = \frac{\rho \pi R^2 \int_{h=0}^{h=H} \left(1 - \frac{h}{H}\right)^2 h \, dh}{\frac{1}{3} \rho \pi R^2 H}$$

$$= \frac{\rho \pi R^2 \int \left(h - 2\frac{h^2}{H} + \frac{h^3}{H^2}\right) dh}{\frac{1}{3} \rho \pi R^2 H}$$

$$= \frac{\rho \pi R^2 \left[\frac{1}{2} h^2 - \frac{2}{3} \frac{h^3}{H} + \frac{1}{4} \frac{h^4}{H^2} \right]_{h=0}^{h=H}}{\frac{1}{3} \rho \pi R^2 H}$$

$$= \frac{\rho \pi R^2 \left[\frac{1}{2} H^2 - \frac{2}{3} H^2 + \frac{1}{4} H^2 \right]}{\frac{1}{3} \rho \pi R^2 H}$$

$$= \frac{\frac{1}{12} \rho \pi R^2 H^2}{\frac{1}{3} \rho \pi R^2 H} = \boxed{\frac{1}{4} H}$$

center of mass of uniform cone.