$$kT = \frac{3}{2}mv^2$$

$$P = \frac{\rho kT}{\mu m_p}$$

$$\frac{dP}{dR} = -\frac{GM_{\rm int}\rho}{R^2}$$

$$M_{\rm int} = -\frac{k}{G\mu m_p}TR\left(\frac{R}{T}\frac{dT}{dR} + \frac{R}{\rho}\frac{d\rho}{dR}\right)$$

$$= -\frac{k}{G\mu m_p}TR\left(\frac{d\ln T}{d\ln R} + \frac{d\ln\rho}{d\ln R}\right)$$

$$\frac{dy/y}{dx/x} = \frac{x}{y}\frac{dy}{dx} = \frac{d\ln y}{d\ln x}$$

$$y = x^p$$

$$\frac{d\ln y}{d\ln x} = p$$

$$\rho_{\rm gas} = K\ \rho_{\rm mass}^{\beta}$$

$$\beta = \frac{\mu m_p \sigma^2}{kT}$$

$$\rho_{\rm mass}(r) = K\left(1+\frac{r}{R_c}\right)^{-3/2}$$

$$\rho_{\rm gas}(r) = K\ \rho_{\rm mass}^{\beta}$$
$$= C\left(1+\frac{r}{R_c}\right)^{-3\beta/2}$$

$$I(r) \propto r^{(-3\beta+0.5)}$$

$$M \sim \frac{Rv^2}{G}$$

$$t_{\rm relax} \sim t_{\rm cross}\ \frac{N}{\ln N}$$