(a) c) λ (MFP) (mean free path) $= \frac{1}{\alpha} = \frac{1}{\rho K}$

$$\lambda \sim \frac{R}{\rho K R} \sim \frac{R}{\tau} \sim 2\,\text{cm}$$

Scattering of photons is a random walk

$$N \sim \frac{R^2}{\lambda^2} \sim \tau^2 \quad \text{(for optically thick)}$$

$$N \sim (3.34)^2 \times 10^{22}$$

$$N \sim 1.1 \times 10^{23} \text{ scatterings}$$

$t_{esc} \sim N \times \left(\frac{\lambda}{c}\right) \sim 1.12 \times 10^{23} \times \frac{R}{c}$ → time b/w each scattering

$$\sim \tau^2 \times \frac{R}{c} \sim \frac{R\tau}{c}$$

$t_{esc} \sim 2.4 \times 10^{5}$ yr

So long time → Stars are pretty opaque → long stability

this is relevant for how much time it takes to transport energy in sun from center to surface $\sim 2 \times 10^{23}$ m