$$L = \frac{1}{n\pi d^2}$$

$$\text{Luminosity} = 4\pi R^2 \, \sigma \, T_{eff}^4$$

$$f(v, v+\Delta v) = \left(\frac{m}{2\pi kT}\right) e^{(-mv^2/2kT)} \, 4\pi v^2 \Delta v$$

$$v_{\rm rms} = \sqrt{\frac{3kT}{m}}$$

$$dI = -I \, \rho\kappa ds$$

$$\frac{dI}{I} = -\rho\kappa ds$$

$$\frac{I}{I_0} = e^{-\rho\kappa s}$$

$$\rho\kappa s = 1 \quad \Rightarrow \quad s = \frac{1}{\rho\kappa}$$

$$I = I_0 \, e^{-\rho\kappa s} \quad \text{becomes} \quad I = I_0 \, e^{-\tau}$$

$$\sigma_{bf} = 1.31 \times 10^{-19} \, \frac{1}{n^5} \left(\frac{\lambda}{5000\,\mathring{A}}\right)^3 \, \mathrm{m}^2$$