ASTR 680 Practice questions for lecture 13: Gravitational lensing

1. Derive the deflection angle for light in the Newtonian approximation. That is, consider light to be a material particle that just happens to travel at a speed c, and use Newtonian gravity. Assume that the massive object is a point mass.

2. Given the size of the Einstein radius for a stellar-mass lens, estimate how many background stars in our Galaxy you would need to observe for there to be a good chance that you would see an event. To do this problem, you'll need to look up quantities such as the number density of stars in our Galaxy, as well as their typical speeds (as part of the problem; why are those numbers necessary?).