

ASTR 680
Practice questions for lecture 19
Clusters: Context and Background

1. Calculate the optical depth to Thomson scattering across a typical cluster.
2. In standard cosmology (i.e., without dark energy), how is the geometry of the universe related to its eventual fate? Explain in particular why a $k = 0$ universe is called “flat”.
3. Qualitatively, how do different “distances” (e.g., proper distance, luminosity distance, angular diameter distance) change with increasing redshift?