ASTR 680 Practice questions for lecture 16: Cluster observations

1. Let the gas in a spherically symmetric cluster have a temperature of 10^8 K, and let it be the same everywhere in the cluster out to a hard cutoff. Then:
(a) How does the density of the gas vary with distance from the center of the cluster? Here we are looking for the functional dependence rather than actual numbers.
(b) Suppose that the X-ray luminosity inside 100 kpc is 10^{44} erg s^{-1}. Suppose also that there is no evidence of net cooling, i.e., something is supplying the heat that is being lost. What candidates exist for that heating?