Name: _____

ASTR500: Mock Cumulative Exam Question #6
A Search for the Most Massive Galaxies: Double Trouble? (Bernardi et al. 2005)
17th March, 2009 – Liz Klimek

Consider a single galaxy with a velocity dispersion equal to the largest value listed in Table 2.

(a) If such a galaxy had a central black hole, how massive would it be? Is this value consistent with what you would expect for a galactic black hole?

(b) Calculate what the Schwarzchild radius would be for this black hole, in AU. You may assume the black hole is non-rotating and spherically symmetric. Compare this radius to the equivalent value for the Milky Way.

(c) The authors mention using the HST to get a light profile in order to search for evidence of a black hole. How close to the center of this galaxy would the HST be able to resolve in the g band?
(Take $H_o = 72$ km/s/Mpc.)