Stars and Galaxies

Coursework Sheet 9

1. In a spectrum of a galaxy the Hβ Balmer line of hydrogen that has a rest wavelength of 486 nm is observed to be close to the wavelength of Hα at 656 nm instead. What is the redshift and radial velocity of the galaxy?

(3 marks)

2. What is the distance according to Hubble's law and lookback time of the galaxy in question 1?

(3 marks)

3. If the galaxy was a member of a cluster with total mass of 10^{14} solar masses and a diameter of 2 Mpc estimate the typical peculiar velocity in the cluster in km s^{-1}. What size error could this cause in the distance for this galaxy and comment on your answer.

(4 marks)