Homework #4

Astronomy 400B

Assignment: Due Apr 17 in class

Problem 1: Using Friedmann Equation to show that $q_0 = \frac{\Omega_0}{2}$ when $\Lambda = 0$.

Problem 2: Show that in an Einstein-de Sitter Universe ($\Omega_0 = 1$, $\kappa = 0$, $\Lambda = 0$) the angular diameter distance reaches maximum at $z = 1.25$, i.e., the angular size of an object with fixed physical size reaches minimum at $z = 1.25$.

Problem 3: Assume that $H_0 = 70$ km s^{-1} Mpc^{-1}, $\Omega_0 = 0.3$, and the universe is flat ($\kappa = 0$), find out what Ω and H was when $z = 0.5$, and when $z = 10$, and what are their values when, in the future, the universe is 10 times as large as today (i.e. $R = 10$).