Cosmology — Problem Set 12 — The Time Evolution of the Universe

Due Thursday, April 27, beginning of class

You will want to consult the notes on "Various Universes." We only live in one universe, but it behaves differently depending on the values for $\Omega_{matter,0}$, $\Omega_{rad,0}$, and Ω_{Λ}. The theory in the notes allows you to make sense of Problem 1. In Problem 1, you explore the time evolution of a matter-dominated universe, the time evolution of a radiation-dominated universe, and the time evolution of a dark-energy dominated universe.

Each of these involves doing an integral, but you are welcome to look the integrals up, or have Wolfram Alpha do them.

Problem 1 — TWB Chapter 15, Query 6, Parts A-C only

Do Parts A through C only of Query 6 on p. 15-17. We did Part A in class, but these are important special cases, so I am having you A again as well as Parts B and C (but not Part D).

Problem 2 — TWB Chapter 15, Query 7, Part A only

Do Query 7 on p. 15-19. I did Part A in class, but it is a critical result and so I am having you write it out.