Homework 2 Solution AST422

(1)

$$T_0 = \frac{1}{H_0} = \frac{1}{500 km/s/Mpc} = \frac{1}{500 \times 10^3 m/s/3.09 \times 10^{22} m} = 6.2 \times 10^{16} s = \frac{6.2 \times 10^{16} s}{3.16 \times 10^7 s} = 2 Gyr$$

$$< T_{earth} \sim 5 Gyr$$

(2)

$$T_0 = \frac{1}{H_0} = \frac{1}{73 km/s/Mpc} = \frac{1}{73 \times 10^3 m/s/3.09 \times 10^{22} m} = 4.2 \times 10^{17} s = \frac{4.2 \times 10^{17} s}{3.16 \times 10^7 s} \approx 13.4 Gyr$$

(3)

$$R_0 = \frac{c}{H_0} = \frac{3 \times 10^5 km/s}{71 km/s/Mpc} = 4225 Mpc \sim 4300 Mpc$$