

PY3726 Assignment 1**Due: Feb 16**

1. Obtain the Friedmann and Raychaudhuri equations when $\Lambda \neq 0$. You can use Carroll or diffgeo to obtain the elements of $G_{\mu\nu}$.
2. Using the result of 1, set $k = 0$ and find an expression for the age of the universe (in terms of H_0 and Λ) to leading order in Λ . Set $p = w\rho$ in your work.
3. Determine the large-universe behaviour of the scale factor for arbitrary k . What are q_0 and H_0 ? Discuss the cosmological implications of your results.