Problem Set 2

8.952 Fall 2004

1. Consider the short-wavelength limit of the scalar wave equation in curved spacetime ("geometric optics"). Show that the wavevector is transported parallel to itself (geodesic equation). Do both the massive and $m = 0$ cases.

   Reference: Misner-Thorne-Wheeler, section 22.5

2. Work out the curvature and dynamical equations for general FRW universe, <u>not</u> assuming $k = 0$.