Problem 2

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

Ref: Misner-Thorne-Wheeler §22.5

2. Work out the curvature and dynamical equations for general FRW universes, not assuming $k = 0$.