8.1. **Fixed points of the optical Bloch equations (OBE)**

(a) Show that the OBE (eqn. 7.67 in the book) have a fixed point solution given by eqn. 7.68.

(b) Set $u = u_0 + u'$ and so forth for $v$ and $w$, where $u_0$, $v_0$, and $w_0$ define the steady-state fixed point from eqn. 7.68. Derive a set of differential equations for $u'$, $v'$, and $w'$ (you would use these to determine the time evolution of these quantities).

(c) Compute the derivative of $(u')^2 + (v')^2 + (w')^2$. Use this to argue that all the dynamics decays at least as fast as $e^{-\Gamma/2}$ and no faster than $e^{-\Gamma}$.

8.2. **Foot 7.3**

8.3. **Foot 7.9**