Homework 7 - Due December 6, 2016

Given $\dfrac{dz}{dt} + \Omega z = 0$, where $\Omega = \alpha + i\beta$ and $z = x + iy$, with $\alpha, \beta, x, y \in \mathbb{R}$ and $\Omega, z \in \mathbb{C}$, define a projection operator $\mathbb{P}$ such that $\mathbb{P}\Theta = \mathrm{Re}(\Theta)$ and $(\mathbb{1} - \mathbb{P})\Theta = i\mathrm{Im}(\Theta)$, where Θ is an arbitrary complex number.