# HW 7

1. Prove the real JCF theorem using the complex one. (Hint: Consider the real and imaginary parts of generalised eigenvectors.)

2. Consider $x' = Ax$ where $A$ is an invertible real $n \times n$ matrix all of whose eigenvalues have real parts $\leq 0$ with at least one having real part $= 0$. Prove that it is not asymptotically stable but it is Liapunov stable.

3. Find the equilibria and solve $-x'' + xx' = 0$ explicitly.