

Homework 4 – Due November 15

* 5.2.1

* 5.2.2

* 5.2.4, 5.2.5, 5.2.6, 5.2.7, 5.2.8 (Rather than the directions given, find the general solution of each system. Express it in real form—no complex numbers.)

* Show that for any 2×2 matrix A having eigenvalues λ and μ , each column of the matrix $A - \lambda I$ is (if nonzero) an eigenvector for the eigenvalue μ .

* Show that by changing the units of x and/or t , the damped harmonic oscillator equation

$$m\ddot{x} + b\dot{x} + kx = 0$$

can always be put in the form we considered in class, namely,

$$\ddot{x} + B\dot{x} + 2x = 0.$$

How is the new parameter B related to the original ones?