

## Assignment 5

due: Thursday, April 19, in class

**Problem 1:** Find the general solution of the following differential equations:

a)  $\ddot{x} - 5\dot{x} + 6x = 0$

b)  $\ddot{x} + \dot{x} + 0.25x = 0$

c)  $\ddot{x} + \dot{x} + 1.25x = 0$

**Problem 2:** Find the general solution as well as the particular solution that satisfies  $x(0) = 10$  and  $\dot{x}(0) = 8$ :

a)  $\ddot{x} - 5\dot{x} + 6x = 3$

b)  $\ddot{x} + \dot{x} + 0.25x = 2$

c)  $\ddot{x} + \dot{x} + 1.25x = 20$

**Problem 3:** Find the general solution for these differential equations:

a)  $\ddot{x} - \dot{x} = t^2$

b)  $3\ddot{x} - 30\dot{x} + 75x = 2t + 1$

**Problem 4:** Check for asymptotic stability in Problems 1 and 2.