

Math 2243 Test 2 Thursday, February 27, 2003.
Section 20, Professor Peter A. Rejto.

1. (25 pts.) Find the general solution to the differential equation:

$$y'' + 6y' + 25y = 0.$$

2. (25 pts.) Find the solution to the initial value problem

$$y'' + 2y' + y = 0 \quad y(0) = 1, \quad y'(0) = 0.$$

3. Given the differential equation:

$$y'' + 4y = \cos 2t.$$

- (a) (15 pts.)

Find an "appropriate trial solution" to this differential equation.

- (b) (10 pts.) Use your trial solution to find a particular solution y_p to this differential equation.

4. Let a family of straight lines be given by,

$$y = 2x + c,$$

where c is a constant.

- (a) (15 pts.)

Find a differential equation for this family of straight lines.

- (b) (10 pts.)

Find a differential equation for the orthogonal trajectories of this family.