Problem Set 2 Differential Equations Due 2/27/06

You are encouraged to work in groups of two to four on this assignment and make a single group submission. Each problem is worth 5 points. For full credit indicate clearly how you reached your answer. All work must be legible and submitted on clean paper without ragged edges.

1. Do problem #10 in §2.3.

2. a) Find a general solution to the partially decoupled system

$$\begin{aligned} \frac{dx}{dt} &= 3x + 2y \\ \frac{dy}{dt} &= 2x \end{aligned} .$$

b) Find a particular solution satisfying the initial condition $(x_0,y_0) = (1,0)$

3. a) Find a general solution to the partially decoupled system

$$\begin{aligned} \frac{dx}{dt} &= 3x + 2y \\ \frac{dy}{dt} &= -2y \end{aligned} .$$

b) Find a particular solution satisfying the initial condition $(x_0,y_0) = (2,5)$

4. a) Find a general solution to the partially decoupled system

$$\begin{aligned} \frac{dx}{dt} &= 2x - 8y^2 \\ \frac{dy}{dt} &= -3y \end{aligned}$$

b) Find a particular solution satisfying the initial condition $(x_0,y_0) = (0,1)$