MATH 266B FALL 2008 PRACTICE FINAL

For maximal credit, show all working. Box or underline your final answers. Each question is worth 5 points. The best 5 solutions will be taken.

(1) Give an explicit solution to the Initial Value Problem

$$xy' - y = 1$$

with $y(1) = 10$.

(2) Find an implicit general solution to

$$\frac{dy}{dx} = \frac{y^3}{5 - 3xy^2}\,.$$

(3) Solve the Initial Value Problem

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

with $y(0) = 0$ and $y'(0) = 2$.

(4) Find the general solution to

$$y'' - 8y' + 16 = 0\,.$$

(5) Solve the Initial Value Problem

$$\mathbf{x}' = \begin{bmatrix} -1 & 1 \\ -1 & -1 \end{bmatrix} \mathbf{x}$$

with $x_1(0) = 4$ and $x_2(0) = 3$.

(6) Find the general solution to the system

$$\mathbf{x}' = \begin{bmatrix} 4 & 3 \\ -3 & -2 \end{bmatrix} \mathbf{x}\,.$$