Math 305 Spring 2011

Assignment 6

The due date for this assignment is Wednesday, April 6.

Instructions: You are encouraged to use a computer to aid with otherwise tedious computations and plotting. In these cases, provide a printout for full credit. Additionally, be sure to demonstrate your knowledge of and competence with the techniques discussed in class, for full credit.

Problem 1 *Section 5.4, #4*

Problem 2 *Section 5.4, #20*

Problem 3 *Section 5.4, #32*

Problem 4 *Section 5.5, #4*

Problem 5 *Section 5.5, #28*

Problem 6

$$ty'' + 2(t-1)y' - 2y = 0,$$
$$y(0) = 0$$

Problem 7

$$y'' + \int_0^t y(\tau)\, d\tau = 0,$$
$$y(0) = 2, \quad y'(0) = 0$$

For the remaining problems, plot each solution on a reasonable domain.

Problem 8

$$y'(t) + 4y(t) = \begin{cases} 1, & 0 \le t \le 4 \\ 2 & t > 4 \end{cases},$$
$$y(0) = 3$$

Problem 9

$$y'' + 4\pi^2 y = 4\pi^2 \left[H(t) - 2H(t-1) + H(t-2) \right]$$
$$y(0) = y'(0) = 0$$

Problem 10

$$x''(t) + 16x(t) = f(t) = \begin{cases} \sin t, & 0 \le t \le \pi \\ 0, & t > \pi \end{cases}$$
$$x(0) = x'(0) = 0$$