MA 238-02 §3.1–4.2, 6.1–6.2	**Test #2** **Take-home part**	*score*	**Name:** _____ **26 April 1999**

INSTRUCTIONS: Work the following problem and turn it in no later than noon on Thursday, April 29, 1999. You may use Maple or other inanimate resources to check you answer or to help you along the way but you must show all of your work so that the solution appears to have been done completely by hand. The work you turn in must be completely your own.

PROBLEM: Use the method of Laplace transforms to find the solution to the IVP

$$y'' + +5y' + 4y = 2u_5(t)\cos(t-5), \quad y(0) = 1, \quad y'(0) = 0$$

where $u_5(t)$ denotes the unit step function step$(t-5)$ in the book's notation and Heaviside$(t-5)$ in Maple's notation. Also sketch (or include computer printout) the graph of the solution on the t-interval $[0, 6\pi]$

NOTE: If you use Maple, you can use the `dsolve` function to solve the IVP. There is an option `method=laplace` you can give `dsolve` that will force Maple to use the method of Laplace transforms. This will increase the probability that Maple's answer will be in the same form as yours. Maple also has `laplace` and `invlaplace` functions for calculating Laplace and inverse Laplace transforms respectively. Enter `?laplace` and `?invlaplace` for help on these functions in Maple.