Math 201, Assignment 5
Due at the beginning of class on July 29, 2015
Illegible or disorganized solutions will receive no credit! Please, for the sake of our marker, be neat!

1) Solve the following IVP:

$$y'' + 6y' + 5y = \delta(t-2), \qquad y(0) = 0, \quad y'(0) = 0$$

2) Find the Laplace Transform of the periodic triangular wave, given by:

$$f(t) = 2t, \;\; 0 \leq t < 2 \text{ and } f(t+2) = f(t)$$

3) Solve the integral equation:

$$y(t) = t + \int_0^t y(x)dx + \int_0^t (t-x)y(x)dx$$

4) Use the convolution theorem to find

$$\mathscr{L}^{-1}\left\{\frac{s^2}{(s^2+1)^2}\right\}$$

5) Use a power series about the point $x = 0$ to solve the following differential equation:

$$y'' - xy' - y = 0$$

Obtain a recursion formula for the coefficients and write the first 3 nonzero terms of the power series of each of the two linearly independent solutions. Include the interval of convergence of the power series.