**Math 322** Assignment 14, Spring 2013 **Due at 3 PM Wednesday, May 8th**

1. Determine whether $x = 0$ is an ordinary point (O), regular singular point (RS) or singular point that is not regular (SNR) for each of the following equations.

   (a) $8x^2y'' + 10xy' + (x-1)y = 0$ (b) $2x^2y'' + 7x(x+1)y' - 3y = 0$

   (c) $y'' - xy' + 2y = 0$ (d) $x^3y'' + 2x^2y' + y = 0$

2. Use the method of Frobenius to obtain **one** solution $y_1(x)$ for the ODE $x^2y'' + (x^2 - 2x)y' + 2y = 0$ corresponding to the larger value of $\lambda$ obtained from the indicial equation. **Show all steps of the solution process, and don't forget to multiply your series by $x^\lambda$.**

3. The indicial equation for the ODE $x^2y'' + xy' + x^2y = 0$ has only one root. Use the method of Frobenius to obtain **one** solution $y_1(x)$ for the ODE using that root.

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