MATH 4305 - Applied Mathematics I
Homework 1 - Method of Successive Differentiation
Due - Monday, September 21, 2015

Use the Method of Successive Differentiation to determine the solution to the following initial value problems:

1. $y' + y + x^2 = xy^2$ with $y(0) = 2$. Find the coefficients from a_0 through a_4.

2. $x^2y'' = 2x + y^2$ with $y(1) = 1$ and $y'(1) = 2$. Find the coefficients from a_0 through a_4.

Use the Method of Successive Differentiation to determine the general solution to the following differential equations.

3. $y'' - xy' + e^x y = 0$ centered at $x_0 = 0$. Find the coefficients through order 5.

4. $xy'' + x^2y' - 2y = 0$ centered at $x_0 = 1$. Find the coefficients through order 4.

5. $y'' - xy' - y = \cos(x)$ centered at $x_0 = 0$. Find the coefficients through order 5.