

**June 10, 2015**  
**Math 201, Tutorial 4**

- 1) Solve the following differential equation:

$$(y\cos(x) + 2xe^y)dx + (\sin x + x^2e^y - 1)dy = 0$$

- 2) The following differential equation is not exact (check this), but can be made exact by multiplying by an appropriate integrating factor. Do so and solve it.

$$(3xy + y^2)dx + (x^2 + xy)dy = 0$$

- 3) Verify that the differential equation

$$y'' + 5y' + 6y = 0$$

has  $y_1 = e^{-2x}$  and  $y_2 = e^{-3x}$  as solutions. Show that these solutions are linearly independent using the Wronskian. What is the general solution to the differential equation; provide the largest possible interval of solution.