

Mathematics 246
Quiz 4

Prof. Lipsman
due: Monday, March 2, 2015

Your Name:

GA's Name:

Section:

Instructions. Solve the following two problems on this sheet of paper. The second problem is on the reverse side. Show all work.

1. For which real values b, c is the following ODE exact:

$$(ty^2 - y - e^t) dt + (bt^2y - ct + y^2) dy = 0?$$

For those values, find an implicit general solution of the equation. Finally, compute the constant in the implicit general solution that obtains for the specific solution which passes through the origin $(0, 0)$.

2. Solve the following IVP:

$$(5t - 3y) dt + (y - 3t) dy = 0, \quad y(1) = 5.$$

The equation is exact. Convert your implicit solution $f(t, y) = c$ into an explicit solution $y = \varphi(t)$ by solving for y . What is the domain of definition of the explicit solution?