

MATH3860 - Elementary Differential Equations, Spring 2013

Quiz 4

Feb, 6 2013

NAME:

ID:

- You have 15 min to complete your quiz.
- Please show all your work neatly and indicate your final answers clearly. If you simply write down the final answer without appropriate intermediate steps, you may not get full credit for that problem.
- The quiz is closed book and notes. **Calculators are not allowed.**

GOOD LUCK :)

1. (15 points) Consider the ordinary differential equation

$$(x + 2) \sin y \, dx + x \cos y \, dy = 0. \quad (1)$$

- (a) Show that the differential equation is not exact.
- (b) Multiplied the equation by $\mu(x, y) = xe^x$. Verify that the resulting equation is exact and solve it.
- (c) Use the general solution found in (b) and solve the initial value problem consisting of

$$(x + 2)xe^x \sin y \, dx + x^2e^x \cos y \, dy = 0 \quad y(1) = \frac{\pi}{2}.$$