

Millersville University
Department of Mathematics

Name _____

MATH 365, *Ordinary Differential Equations*, Homework 09
November 12, 2008

Find the solutions to the following exercises. Answers without justifying work will receive no credit. Partial credit will be given as appropriate, do not leave any problem blank. Each problem is worth 10 points. Your completed assignment is due at class time on Friday, November 14, 2008.

1. Show that $\frac{d}{dx} [xJ_1(x)] = xJ_0(x)$.

2. Evaluate the indefinite integral

$$\int x J_0(x) dx.$$

3. Evaluate the indefinite integral

$$\int x^3 J_0(x) dx.$$

4. Find the general solution of the ODE:

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