

Millersville University
Department of Mathematics

Name _____

MATH 365, *Ordinary Differential Equations*, Homework 08
November 5, 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 7, 2008.

1. Solve each of the following ODEs/IVPs.

(a) $t^2y'' - 2ty' + 2y = 0$

(b) $4t^2y'' + y = 0; y(1) = 1, y'(1) = 1$

(c) $t^2 y'' - 2y = t$

(d) $t^2 y'' + y = 16 \sin(\ln t)$

2. Consider the ODE

$$(2t + 3)^2 y'' + (2t + 3)y' - 2y = 0.$$

Making the change of variable $2t + 3 = e^z$, solve the ODE above.

3. Consider the ODE

$$y'' + (\tan t)y' + (\cos^2 t)y = 0.$$

Making the change of variable $z = \sin t$, solve the ODE above.