

Millersville University
Department of Mathematics
MATH 365, *Ordinary Differential Equations*, Homework 02
September 3, 2008

Name _____

Find the solutions to the following ordinary differential equations and initial value problems. 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, September 5, 2008.

1.
$$\frac{dy}{dt} = \frac{(y-1)(t-2)(y+3)}{(t-1)(y-2)(t+3)}$$

2. $\frac{dy}{dt} + \cot t y = \cos t$

3. $\frac{dy}{dt} = -\frac{3t + ty^2}{2y + t^2y}$ and $y(\pi/2) = 0$

4. $\frac{dy}{dt} = t - \frac{y}{3t}$ and $y(1) = 1$

5. $\frac{dy}{dt} = \frac{4y^2 - t^4}{4ty}$ (*Hint*: change the dependent variable to $v = y/t$. Use this to find the solution to the original equation.)

6. $\frac{dy}{dt} + 2y = y \ln y$ (*Hint*: change the dependent variable to $v = \ln y$. Use this to find the solution to the original equation.)