

**HOMEWORK 8**  
**DIFFERENTIAL EQUATIONS**  
**DUE 09-10**

**Show your work!**

- (1) Consider the initial-value problem

$$\dot{y} = (t + 1)^2 - (y - 1)^2, \quad y(0) = c.$$

For what value of  $c$  does the solution have the steepest tangent line at  $t = 0$ ?

- (2) Your friend tries to perform a qualitative analysis of the equation

$$\dot{y} = y - t.$$

He begins by setting the right-hand side equal to 0,

$$0 = y - t,$$

and says that he has found that  $y = t$  is an equilibrium solution.

- (a) What mistake did your friend make?  
(b) Is  $y = t$  a solution?
- (3) **Four** book problems: #1.6.31, 36, 39, 44.