

## Quiz 1

Name: \_\_\_\_\_

You will have 20 minutes ◦ Calculators are allowed ◦ Show all work for credit ◦ Don't cheat ◦ attempts at a problem may count for partial credit.

1. [2 pts] Give an example of an autonomous differential equation.
  
  
  
  
  
  
  
  
  
  
2. [2 pts] Give an example of a pure-time differential equation.
  
  
  
  
  
  
  
  
  
  
3. [3 pts] Translate the following sentence into a differential equation: “The rate of decrease of the temperature of a coffee cup is a constant 4 degrees per minute.” Be sure to define any variable you use.
  
  
  
  
  
  
  
  
  
  
4. [1 pts] What is the state variable in problem 3?
  
  
  
  
  
  
  
  
  
  
5. [2 pts] Find a solution to the differential equation

$$\frac{df}{dt} = 2t + 1$$

such that  $f(0) = 2$ .