Quiz 1 Solutions

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. $\frac{dy}{dt} = 10 - y$

2. [2 pts] Give an example of a pure-time differential equation. $\frac{dy}{dt} = 4t$

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. $\frac{dT}{dt} = -4$, where T is the temperature of the coffee.

4. [1 pts] What is the state variable in problem 3? Temperature

5. [2 pts] Find a solution to the differential equation

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

such that $f(0) = 2$. $f(t) = t^2 + t + 2$.