Name_____ Student I.D._____

Math 2250–4 Quiz 2 January 20, 2012

1) Consider the differential equation for x(t):

$$x' = -\frac{1}{2}(x-30).$$

a) Is this differential equation separable, linear, neither separable nor linear, or both? Explain.

(2 points)

b) Solve the following initial value problem:

$$x' = -\frac{1}{2}(x - 30)$$

 $x(0) = 70$.

(6 points)

2) A cooling object is found outside, where the ambient temperature is a constant 30° (Farenheit). At the time the object is found, its temperature is found to be 70° , and the object is cooling off at a rate of 20° per hour. Assuming that the object is cooling according to Newton's Law of Cooling, i.e. at a rate proportional to the difference its temperature and the ambient temperature, show that the temperature of the object satisfies the initial value problem in (1b).

(2 points)