

## Math 2260 Quiz 6

Name \_\_\_\_\_

*Points will be deducted for untidy or disorganized answers*

*Newton's Law of Cooling* states that the rate of cooling of an object is proportional to the temperature difference between the the object and its surroundings, provided that this difference is not too large.

If we let  $H$  denote the temperature of the object at time  $t$  and  $H_S$  the constant surrounding temperature, then the differential equation is:

$$\frac{dH}{dt} = -k(H - H_S).$$

1. (5 points) Suppose that a certain object takes 40 min to cool from  $30^\circ\text{C}$  to  $24^\circ\text{C}$  in a room that is kept at  $20^\circ\text{C}$ .
  - (a) What was the temperature of the object 15 min after it was  $30^\circ\text{C}$ ?
  - (b) How long will it take the object to cool down to  $21^\circ\text{C}$ ?