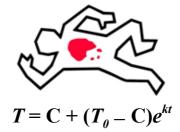
## **C.S.I.** Maroons

A detective is called to the scene of a crime where a dead body has just been found. She arrives on the scene at 10:23 pm and begins her investigation. Immediately, the temperature of the body is taken and is found to be 80° F. The detective checks the programmable thermostat and finds that the room has been kept at a constant 70° F for the past 3 days.



After evidence from the crime scene is collected, the temperature of the body is taken once more and found to be 78.5° F. This last temperature reading was taken exactly one hour after the first one. The next day the detective is asked by another investigator, "What time did our victim die?" Assuming that the victim's body temperature was normal (98.6° F) prior to death, what is her answer to this question? Newton's Law of Cooling can be used to determine a victim's time of death.

## PART I: Find k

$$T = \mathbf{C} + (T_{\theta} - \mathbf{C})e^{kt}$$

## PART II: Find t, the time of death:

$$80 = 70 + (98.6 - 70) \cdot e^{Kt}$$
 $10 = 28.6 \cdot e^{Kt}$ 
 $10 = 28.6 \cdot e^{Kt}$ 
 $10:23 \, PM$ 
 $10:23$ 

## HW 2.3 - Day 2 Answers continued

- 3.)a.) k = -0.0419
  - b.) t = 69.6 minutes
- 4.)a.) k = -0.1643
  - b.) t = 11.5 minutes
- 5.)a.) k = -0.0024
  - b.) T.O.D. = 7:26 AM