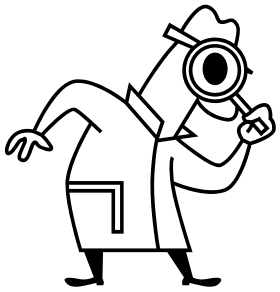
CSI: RHS

Group Members:
_____
_____
_____

You have just discovered a murder victim. You (somewhat illegally) decide to take it upon yourself to solve this crime.

Newton's Law of Cooling states that the rate of cooling of an object is proportional to the temperature difference between the object and its surroundings. By taking temperature readings of the object and the room (the "environment"), you are able to determine the time of the murder.

Things you need to know:



Time the body was found: _____
Temperature of the body at that time: _____
Surrounding Temperature: _____
Temperature of the body 30 minutes later: _____
(Remember the corpse gets colder as time elapses)
Assume normal body temperature to be 98.6°.

$$T(t) = T_E + (T_O - T_E)e^{-kt}$$

(This formula is used twice when solving these problems; follow the example from in class)

Project Requirements:

- You need to come up with a list of 4 suspects. Each has his/her own alibi that accounts for certain times of the day. Every suspect has some unaccounted time of the day in their alibi. Of course each suspect's unaccounted time should be different. Each suspect must have at least 3 different details in his/her alibi.

  ex. Suspect 1: _____

  Alibi detail 1: at school from 9:00 – 2:00
  Alibi detail 2: seen at Starbucks 2:15 – 3:45
  Alibi detail 3: home studying from 5:30 until bed time
  Unaccounted time: **2:00 – 2:15 and 3:45 – 5:30**

- You will be presenting your project to your classmates on **Thursday, October 11th.**
- Each presentation must include some type of visual aids, such as power point, video, "evidence folder," etc. Be creative! (No posters please). All props must be school appropriate!!
- You will EACH turn in your project packet with the information listed in on page 1 (temperatures, times, etc.).
- You will use Newton's Law of Cooling to determine the time of death, thus solving your case. You must show all work from the formula, and you must include the name of the culprit.
- You must present your math in your presentation then reveal the name of the perpetrator
- You may not use any of the same combinations of numbers used in the examples. Do not use the alibi details given in our example. Your numbers must be unique from all of the other groups so I will give you Surrounding Temperature (Te).

This project will count as a QUIZ GRADE! Please follow all directions and deadlines. YOUR ENTIRE PROJECT MUST BE SCHOOL APPROPRIATE. If it is not, it will be sent to administration. Please ask questions. Please impress us with your creativity. Remember, it's a quiz grade! The project may be done with a group, however, **every person must turn in the page with your calculations.**

For your project, please fill in the information provided, and use the facts to solve the mystery.

Project name(s): _____

Brief description: _____

Time the body was found: _____
Temperature of the body at that time: _____

Surrounding Temperature: _____
Temperature of the body 30 minutes later: _____

4 suspects (include in visual & presentation)

- Details, motive, alibis, and unaccounted time

Work shown to determine time of death:

k = _____ t = _____

Therefore, the crime occurred at _____ (time),

so the criminal was _____!

Grading Rubric

Your project counts as a quiz grade. Your grade will be determined by the sum of the points given below:

_____ /40 Work (math)
Math is correct, all work shown, suspect identified, turned in on correct due date

_____ /28 Suspects (7 points each)
Suspect identified, 3 details per suspect (1 point each), unaccounted time correct (2 points), visual for the suspect (2 pts)

Suspects: 1 _____ 2 _____ 3 _____ 4 _____

_____ /32 Presentations
Some type of visual provided, clear presentation, all introductory information included (time body found, temperature, room temperature, later body temperature), prepared on due date

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EXTRA CREDIT!

_____ /5 WOW factor
Project was exceptionally creative, time obviously spent, went above and beyond

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_____ /100 Total = Quiz Grade