Exponential Functions

I have been a huge fan of shows and books where forensic science is the main topic. I often thought that becoming a medical examiner would be an exciting job. I am a huge fan of Patricia Cornwell and her books about Dr Kay Scarpetta, who is a medical examiner. Throughout the many books that she has written I have seen on more than one occasion where there was difficulty with determining the time of death.

When a deceased body is found one of the first things they do is take a core temperature of the victim and also take the temperature of the room. I have read in more than one book that the temperature of the room was altered by turning the air down very low or the heat up very high so that the time of death can be difficult to pin point.

Crime shows such as the CSI series and Criminal Minds often will have the temperature of the area where the body was found be altered so that the medical examiner gives and inaccurate time of death and during the course of the investigation it is determined that that the killer altered the surroundings of the body by turning the temperature either way up or way down.

As we studied exponential functions I realized that there was a way to determine the time of death, so I went looking for the formula for determining the time of death. The medical examiners use Newton’s law of cooking to determine the time of death. T(t)=T\_e+(T\_o-T\_e)^(-kt) where T\_o is the normal human temperature and approximately 37degrees Celsius, T\_e is the temperature of the surroundings where the victim was found and k is a constant that depends on body characteristics.

Although I do wonder when the temperature of the room is altered by turning an air conditioner way down or turning the heater way up what kind of changes need to be made to the formula. I have seen on crime shows such as CSI and Criminal Minds where the temperatures were altered so that the time of death would be incorrect during the initial investigation.

Forensic science also uses quadratic applications to help solve many different crimes. One is by using a formula for determining how far a bullet has traveled by obtaining its velocity. By using the formula h(t)=-16t^2+64t+80 with t being the time in seconds when the item reaches its maximum height. The crime scene investigator can use this application or one similar to it to determine many different things from how tall the shooter was, the distance from the victim or how close the gun was to the victim.

Forensic science is such a broad subject and there are many other times where algebraic formulas can be used. I have seen them use a shadow of a suspect and the shadow of a building and be able to determine how tall the suspect was based on the height of their shadow and the shadow of a nearby building. I enjoy watching and reading as the investigators discuss the different ways the can determine how tall a suspect is, how far away they were and what item they may have used.