

# MATH 315: Fall, 2024

## Assignment 4

Due: Wednesday, September 25

### **I. Examining the Richardson Arms Race Model.**

Read: Part V (*Interpreting and Testing The Richardson Model*) in Chapter 2: **Stable and Unstable Arms Races** .

Complete Problems 24, 25, 28 of Chapter 2.

### **II. The Homicide Problem and the "Trial of the Twentieth Century"**

The dead body of Nicole Brown was discovered outside her Los Angeles condominium around midnight on June 13, 1994. Medical Examiner Quincy arrived on the scene at 12:30 AM. Quincy immediately took the murder victim's body temperature; it registered as  $94.6^{\circ}$  F. The police investigation of the murder scene lasted one hour. Just before the body was wheeled away and the police left, Quincy took the victim's temperature again; this time, his thermometer showed  $93.4^{\circ}$ F.

A problem prosecutor Marcia Clarke faced was to use the facts described to estimate the time of the death, a critical piece of evidence in the trial of O. J. Simpson.

Develop a mathematical model that would assist Clarke in carrying out this task. What physical assumptions are you making? Is there enough data explicitly described in our first paragraph to use the model to make the estimation? What additional data might you need? Is there any evidence in our story that you have overlooked?

**You only need to *formulate* the model. You do not have to solve any differential equations.**

#### **Quote of the Day**

There is general recognition that the application of mathematics in all the social sciences has brought a multitude of results that would never have been obtained if researchers had been confined to languages such as English. Despite their richness, such languages are unsuitable for complicated quantitative and logical relationships.

- Ian Bradley and Ronald L. Meek, *Matrices and Society*