Lab 9

Stat 427

Fall 2020

Instructions

Complete all questions. To prepare for the randomly collected lab, follow the instructions on the class website to prepare the work for submission. These submission rules will apply to all labs throughout the semester.
Mathematical functions

(1) Create a graph of each of the following quadratic fuctions
   (a) $y = x^2 - x - 1$
   (b) $y = x^2 - x + 1$
   (c) $y = -x^2 + x + 1$
   (d) $y = -x^2 + x - 1$

(2) Newton's law of cooling is given by the following equation:

$$T = a + (T_0 - a)e^{-kt}$$

Here T is the temperature of an object at time t, T_0 is the initial temperature of the object, a is the ambient temperature, and k is the cooling rate (decay rate) constant with a value dependent on the properties of the object. A furnace in a house suddenly ceases to function. The temperature at the moment the heating stops is 74°F. The temperature outside is 25°F. The cooling rate of the house is $k = 0.1248$, and time is measured in hours. Create a graph of the house's temperature measured in hours, for the next 36 hours.