Lab #3 Modeling a Cold with a Quadratic *Franz Helfenstein* NAME

We all suffer from colds. Here is some data giving average virus levels in the blood of people exposed to a nasty cold virus. 'Day' refers to days since noticing the symptoms and 'virus' refers to virus level on a scale of 100. Before plotting the information in the T-table we must decide which variable is the dependent variable.

Day	Virus
0	10
1	20
2	38
3	55
4	72
5	81

1) Which variable is the dependent variable?

2) Plot the data. Interpret and describe what is physically occurring according to the data. Use vocabulary normally associated with a person's health.

3) The data does not appear to be linear. Furthermore, a linear model would be unrealistic considering the circumstances. Explain why a Linear Model would be <u>inappropriate</u> for the normal evolution of a cold.

4) Explain why a Quadratic Model would be a good model for the evolution of a cold.

5) Use the TI's regression feature to generate the best Quadratic model for this data. Store that result in Y_1. Write your result here (rounded to 3 significant digits)

6) Plot your data and your quadratic model in a friendly window. Give the dimensions of your Friendly Window. [xmin, xmax] × [ymin, ymax]

7) Now that we have the model, we can use it to answer a variety of questions. At what <u>time</u> and with what <u>virus level</u> is the cold at its <u>worst</u>?

8) The symptoms first appeared with a <u>virus level of 10</u>. Assuming the symptoms go away below a virus level of 10, at what time will the symptoms go away?

9) At what time will the cold be completely gone?

10) When did you actually catch the cold. That is, when did the virus level first become greater than 0?