

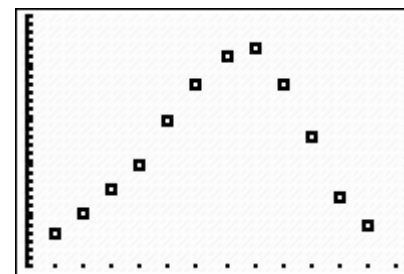
## Sinusoidal Regression Equations on Your Calculator

The average monthly temperatures for the city of Seattle are given below. Plot these data points into your calculator and let Jan have an input value = 1.

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
41°	44°	47°	50°	56°	61°	65°	66°	61°	54°	46°	42°

View the data. Your screen should be similar to the diagram shown to the right.

Answer the following questions using your diagram and the data points above.



1. Find the amplitude of the graph that models the monthly temperatures.
2. Find the vertical shift of the graph.
3. What is the period of the graph. (How long does it take the graph to repeat)
4. Does the graph relate more closely to a cosine graph, or sine graph? Why?
5. What is the horizontal shift of the graph.
6. Write a sinusoidal function that models the behavior of the graph using  $t = 1$  to represent January.
7. Use your calculator to determine a regression line. Write the answer to that regression line below. Are they equivalent functions?

Go online and find a similar example of data that has been collected. You may use the website <http://www.weatherbase.com>. A link to it can be found on Mr. Deal's Homepage.

Write the data below into a table and type into your calculator.


1. Find the amplitude of the graph that models the monthly temperatures.
2. Find the vertical shift of the graph.
3. What is the period of the graph. (How long does it take the graph to repeat)
4. Does the graph relate more closely to a cosine graph, or sine graph? Why?
5. What is the horizontal shift of the graph.
6. Write a sinusoidal function that models the behavior of the graph using  $t = 1$  to represent January.
7. Use your calculator to determine a regression line that represents the sinusoidal equation
8. What other examples can you think of that entail a periodic graph, or a repetitious pattern?