

TI-83 Plus Calculator: Using Sinusoidal Regression to Find the Curve of Best Fit

5.9



The TI-83 Plus calculator can draw a curve of best fit for data on a scatter plot. The calculator can also provide the equation of the trigonometric function for this curve.

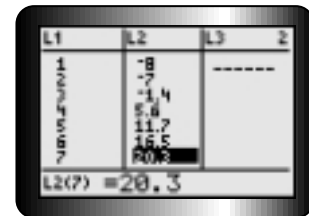
This table gives the mean monthly temperature in degrees Celsius for Kingston, Ontario.

Month	J	F	M	A	M	J	J	A	S	O	N	D
Mean Monthly Temperature (°C)	-8	-7	-1.4	5.6	11.7	16.5	20.3	19.5	15.2	8.8	3	-4.3

Ensure that the calculator is in radian mode.

1. Enter data into lists.

To create a scatter plot, begin by entering the data into lists. Enter the months into L1 and the corresponding temperature values into L2. Use 1 for January, 2 for February, and so on. Press **[STAT]** **[1]** to edit the lists.



step 1

2. Open the stat plot editor and adjust the settings.

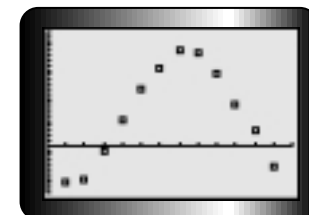
Once you have entered all the values into the appropriate lists, select the first stat plot. Press **[2nd]** **[Y=]** **[1]** **[ENTER]**. Make sure that you have the Type, Xlist, and Ylist set as shown.



step 2

3. View the scatter plot.

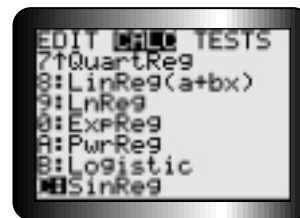
Press **[ZOOM]** **[9]**. The data is clearly nonlinear. The scatter plot resembles a sine curve or a cosine curve.



step 3

4. Find the equation of the curve of best fit

To find the equation of the curve of best fit, you can use sinusoidal regression. Press **[STAT]** and scroll over to **CALC**. Scroll down to **C:SinReg** and press **[ENTER]**.



step 4

5. Enter the names of the lists.

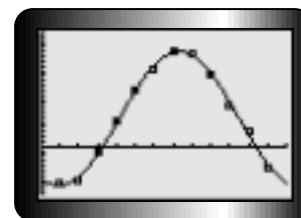
Press **[2nd]** **[1]** **[,]** **[2nd]** **[2]** **[,]** **[VAR]**. Scroll over to **Y-VARS**, then press **[1]** **[1]**. You have stored the equation of the curve of best fit in the equation editor under **Y1**. Press **[ENTER]** to display the results.



step 5

6. Display the curve of best fit.

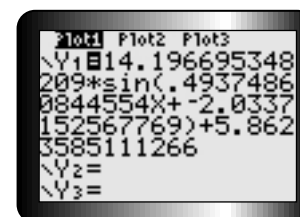
Press **[GRAPH]**.



step 6

7. Display the equation of the trigonometric function.

Press **[Y=]**. The equation that best represents the data is $y = 14.2 \sin(0.5x - 2) + 5.9$.



step 7

Practice 5.9

- The table shows an individual's blood pressure in millimetres of mercury.

Time (s)	0	0.25	0.5	0.75	1	1.25	1.5	1.75	2
Blood Pressure (mm)	100	120	100	80	100	120	100	80	100

Write the trigonometric equation that models this relationship

- Return to section 5.7 and use SinReg to confirm your answers to questions 13, 14, 15, 16, and 17.
- Answer the Chapter Problem by using sinusoidal regression and compare the graph and model to the work previously done. Account for any differences.