Math 130
Sinusoidal Regression on TI-83

These instructions will help you
• Enter data
• Plot data points in a scatter plot
• Fit a sinusoidal function to those data and plot it to see how well it fits.

1. Preparing the STAT editor:

First steps: If you are plotting points for the first time or you haven’t used the Statistics editor for a while, start here.

Turning ON the STAT PLOT:
Go to the STAT PLOT menu by pressing \texttt{2nd Y=} and then press \texttt{ENTER} with the cursor on 1:Plot 1

Turn on the STAT PLOT by pressing \texttt{ENTER} with the cursor on ON and highlight the Type and Mark as shown

Note the Xlist is L1 and the Ylist is L2

Clearing the STAT editor:
If there are data stored in the lists L1 and L2, you will want to clear the lists.
To clear the statistics editor press the \texttt{STAT} button and then \texttt{4} (ClrList)

Now type in \texttt{2nd 1} to get L1, then type a comma , and follow it with \texttt{2nd 2} to get L2 (etc.)

then press \texttt{Enter}

You can also clear individual lists by arrowing up to the top of the list (where the name is) pressing \texttt{Clear} and then pressing \texttt{Enter}.

2. Plotting Data

Begin by making sure that STAT PLOT 1 is ON (See above)

Example: Enter the table below in the statistics editor:

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>23.11</td>
<td>14.40</td>
<td>37.35</td>
<td>50.68</td>
<td>30.41</td>
<td>13.00</td>
<td>29.76</td>
<td>50.55</td>
<td>37.97</td>
<td>14.65</td>
</tr>
</tbody>
</table>

To put data into the statistics editor: Press the \texttt{STAT} button and then \texttt{ENTER} with the cursor on EDIT

Begin entering data by putting \texttt{x} values in L1 and \texttt{y} values in L2

Go to the \texttt{ZOOM} menu and press \texttt{9} (Zoom Stat) and the graph will follow.

Over:
3. Generating a Sinusoidal curve to fit the data

Press the \textbf{STAT} button \hfill (1)

Use the \textbf{Right Arrow} to move over to \textbf{CALC}, then Down Arrow to C:SinReg and press \textbf{ENTER} \hfill (2) \& (3)

\begin{itemize}
  \item (1)
  \item (2)
  \item (3)
\end{itemize}

\textbf{In order to store the results in the y= editor, do the following:}

With the cursor just to the right of the SinReg notice (see step (3) above),

Press the \textbf{VARS} button \hfill (4)

Right Arrow over to Y-VARS and press \textbf{ENTER} \hfill (5)

With the cursor on \textbf{Y1} press \textbf{ENTER} again \hfill (6)

To execute the regression routine Press \textbf{ENTER} \hfill (7)

The regression function will be displayed in the form \( y = a \cdot \sin(bx + c) + d \) ** \hfill (8)

\begin{itemize}
  \item (4)
  \item (5)
  \item (6)
  \item (7)
  \item (8)
\end{itemize}

To see that your equation matches the data, press the \textbf{GRAPH} button \hfill (9)

\begin{itemize}
  \item (9)
\end{itemize}

\textbf{**The equation is stored in the Y= editor. Press Y=} in order to see the function.} \hfill (10)

\begin{itemize}
  \item (10)
\end{itemize}

If you try to graph something later and you get the Error message below (1), you need to turn off the STAT PLOTS. In the Y= editor (2), go to the very top where Plot1 is highlighted (2) and press enter to turn it off (3).

\begin{itemize}
  \item (1)
  \item (2)
  \item (3)
\end{itemize}