TI 83 Line of Best Fit

Produces a scatterplot, and then a line of best fit for a table of data involving two variables.

1. Press \text{STAT} (left of arrow buttons)
2. Press 1:Edit (or press \text{ENTER} since 1 is the default choice)

3. If the list has data in it already, as shown below, you can clear the list(s)

To clear a list,

a. Press \text{STAT} button

b. Press 4 to choose 4:ClrList

ClrList

c. Press \text{2nd} and the 1 key (which will enter a L1 if you want to erase List 1)
d. Press \text{ENTER} and you will see this

ClrList L1

Done

e. Repeat steps a through d until all the lists you want cleared are clear. To clear list 2, in step c you would press \text{2nd} and the 2 key, and so on. You can also clear several at one time by entering commas between list names as in

ClrList L1
ClrList L2
ClrList L1, L2

Done
4. If you had to clear lists, you need to repeat steps 1 and 2 to see empty lists ready to be filled. (Steps 1 and 2: Press \texttt{STAT} and \texttt{ENTER})

\begin{center}
\begin{tabular}{|c|c|c|}
\hline
L1 & L2 & L3 \\
\hline
\hline
\end{tabular}
\end{center}

L1(1) =

5. Start entering data into L1, pressing \texttt{ENTER} after each item. L1 is using the x value from each (x,y) pair. Examples are shown below.

6. When you are done with L1, use the right arrow key, \textbullet, to get into L2

\begin{center}
\begin{tabular}{|c|c|c|}
\hline
L1 & L2 & L3 \\
\hline
1 & \hline
5 & \hline
11 & \hline
14 & \hline
18 & \hline
28 & \hline
37 & \hline
\hline
\end{tabular}
\end{center}

L2(1) =

7. Enter the L2 data, pressing \texttt{ENTER} after each item. Some sample data is below.

\begin{center}
\begin{tabular}{|c|c|c|}
\hline
L1 & L2 & L3 \\
\hline
1 & 5 & \hline
11 & 14 & \hline
18 & 28 & \hline
37 & \hline
\hline
\end{tabular}
\end{center}

L3(1) =

8. You may need to adjust the Window to fit your data. Press the \texttt{WINDOW} key (beside the Y= key)

\begin{center}
\texttt{WINDOW}
\begin{itemize}
\item \texttt{Xmin} = -10
\item \texttt{Xmax} = 10
\item \texttt{Xscl} = 1
\item \texttt{Ymin} = -10
\item \texttt{Ymax} = 10
\item \texttt{Yscl} = 1
\item \texttt{Xres} = 1
\end{itemize}
\end{center}

a. In our case, the Ymax is not big enough. You can change those values.

\begin{center}
\texttt{WINDOW}
\begin{itemize}
\item \texttt{Xmin} = -10
\item \texttt{Xmax} = 10
\item \texttt{Xscl} = 1
\item \texttt{Ymin} = -10
\item \texttt{Ymax} = 40
\item \texttt{Yscl} = 1
\item \texttt{Xres} = 1
\end{itemize}
\end{center}

9. Before you graph, you should turn off any graphs in the Y= window.
a. Press the $Y=$ key.

b. Drag the cursor over the highlighted $=$ and press $\text{ENTER}$. This will ‘turn off’ the graphs of those functions without you having to erase that function. You will lose the $Y1$ function during the best fit process.

10. You need to turn on the scatter plot function.
   a. Press $2^{\text{nd}}$ and the $Y=$ key (to turn on the STAT PLOT)
   b. Press $\text{ENTER}$ to choose Plot 1
   c. Press $\text{ENTER}$ again while the cursor is over the On.
   d. Make sure that your Xlist is L1 and your Ylist is L2

11. Press the $\text{GRAPH}$ key

12. Now we will try to find the line of Best Fit. We’re going to try to fit it to a straight line. Other types of functions could be used (fit it to a quadratic equation, or a cubic, or a natural log,……)
   a. Press the $\text{STAT}$ key
b. Arrow over to the \texttt{CALC} menu

\begin{verbatim}
EDIT \texttt{CALC} TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7:QuartReg
\end{verbatim}

c. Press 4 to choose 4:LinReg(ax + b)

\begin{verbatim}
LinReg(ax+b) \n\end{verbatim}

d. Press \texttt{2nd} and the \[ key to get L1
e. Press the comma key ,
f. Press \texttt{2nd} and the \[ key to get L2
g. Press the comma key ,
h. Press the \texttt{VARS} key (below the arrows, next to \texttt{CLEAR})
i. Arrow over to \texttt{Y-VARS}

\begin{verbatim}
VARS \texttt{Y-VARS}
1:Function...
2:Parametric...
3:Polar...
4:On/Off...
\end{verbatim}

j. Press \texttt{ENTER} to choose 1:Function and see

\begin{verbatim}
FUNCTION
1:Y1
2:Y2
3:Y3
4:Y4
5:Y5
6:Y6
7:Y7
\end{verbatim}

k. Press \texttt{ENTER} again to select Y1

\begin{verbatim}
LinReg(ax+b) L1, L2, Y1 \n\end{verbatim}

l. Press \texttt{ENTER} again to process your request and you will see our line of best fit is approximately \( y = 5.29x - 0.71 \)

\begin{verbatim}
LinReg
y=ax+b
a=5.285714286
b=-.7142857143
r^2=.9806590258
r=:.990282296
\end{verbatim}

The close |r| is to 1, the better fit you have.
13. Press the \texttt{GRAPH} key to see your best fit line together with your scatter plot.

14. You can also see your line of best fit as \texttt{Y1} if you press the \texttt{Y=} button.