Using the TI-83 or TI-83 Plus Calculator

Clearing existing data lists:

2nd + \( \rightarrow \) ENTER

Enter data to lists:

STAT \( \rightarrow \) (Select 1:Edit) \( \rightarrow \) ENTER \( \rightarrow \) (Input data into lists)

Creating Regression Equations:

STAT \( \rightarrow \) (Select CALC) \( \rightarrow \) ENTER \( \rightarrow \) (Select Desired Regression) \( \rightarrow \) ENTER

Setup of Scatter Plot:

STAT PLOT \( \rightarrow \) 2nd Y= \( \rightarrow \) (Select 1:Plot 1) \( \rightarrow \) ENTER

Select other items such as “Type”, “Xlist”, “Ylist”, and “Mark” as required. The items selected in sample display are recommended for scatter plots.
Automatic Input of Regression Equation:

1. Y=1
2. (Put cursor at Y1=)
3. VARS
4. (Select 5:Statistics)
5. ENTER
6. (Select EQ)
7. ENTER
8. (Select 1:RegEQ)
9. ENTER
10. (Equation is ready to plot or evaluate.)

Solving Equations using Matrices on the Calculator:

1. MATRIX
2. 2nd
3. X^-1
4. (Select EDIT)
5. ENTER
6. (Type in size of Matrix. For the [A] Matrix put 3 X 3. For the [B] Matrix put 3 X 1.)

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Perform process for both Matrix [A] and Matrix [B]. You are now ready to perform Matrix Multiplication.

Matrix [A] and Matrix [B] are given.

Matrix [A]:
\[
\begin{bmatrix}
4 & 1 & -2 \\
3 & 1 & 2 \\
5 & 1 & 6
\end{bmatrix}
\]

Matrix [B]:
\[
\begin{bmatrix}
1 & 0 & 0 \\
0 & 1 & 0 \\
0 & 0 & 1
\end{bmatrix}
\]

First, find the inverse of Matrix [A].

Matrix [A]^{-1}:
\[
\begin{bmatrix}
3 & -1 & 2 \\
-3 & 1 & -2 \\
1 & 0 & 0
\end{bmatrix}
\]

Then, multiply the inverse of Matrix [A] by Matrix [B].

Matrix [A]^{-1}[B] = \begin{bmatrix} 10 \\ -7 \\ 13 \end{bmatrix}
Finding X-intercepts (Zero Values) and Min / Max Values (Vertex):

1. Use the `2nd` key followed by `TRACE` to select `Plot 1` and press `ENTER`.

2. Using arrow keys, locate the cursor on the graph to the left of the intersection with the x-axis and press `ENTER`.

3. Do the same for the right side of the intersection with the x-axis.

4. Notice that there are two intersections with the x-axis. Repeat the process for each intersection of the x-axis.

5. As close as possible to the intersection with the x-axis, press `ENTER`.

6. Finding min / max values (coordinates of the Vertex):

   - Use the `2nd` key followed by `TRACE` to select `minimum` or `maximum` depending on whether it opens up or down.
   - Press `ENTER`.

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(Using arrow keys locate a point to the left of lowest point on graph.)

(Using arrow keys locate a point to the right of the lowest point on graph.)

(Using arrow keys move cursor to a position near the minimum or maximum point on graph.)

(Enter)

(Enter)

(Using arrow keys move cursor to a position near the minimum or maximum point on graph.)

(Enter)

(Result – minimum or maximum value for the range – also coordinates for the vertex.)