The more you experiment with a graphing calculator, the more comfortable and efficient you will become with it.

A TI graphing calculator can detect several types of errors and display an error message. When this occurs, refer to Section B.26 for explanations of some common error messages and how to fix these types of mistakes. Errors do not hurt the calculator. In fact, you can't hurt the calculator regardless of the order in which you press its keys. So, the more you experiment with the calculator, the better off you will be.

To access a TI-83 command written in yellow above a key, first press 2nd, then the key. Whenever a key must follow the 2nd key, this appendix will use brackets for the key. For example, “Press 2nd [OFF]” means to press 2nd and then press ON (because “OFF” is written in yellow above the ON key). The same applies for TI-84 commands written in blue above a key.

Aside from having different-colored keys, the TI-83 and TI-84 are similar calculators: Virtually all of the key combinations for a TI-83 and a TI-84 are the same.

Instructions for using a TI-85 and a TI-86 (as well as a TI-82 and a TI-83) graphing calculator are available at the website www.prenhall.com/divisions/esm/app/calc_v2/. This site also can serve as a cross-reference for TI-83 graphing calculator instructions. Since the TI-83 and TI-84 are so similar, TI-84 users will find the site helpful even though the TI-84 is not mentioned.

### B.1 Turning a Graphing Calculator On or Off

To turn a graphing calculator on, press [ON]. To turn it off, first press 2nd. Then press [OFF].

### B.2 Making the Screen Lighter or Darker

To make the screen darker, first press [2nd] (then release it); then hold the △ key down for a while. To make the screen lighter, first press [2nd] (then release it); then hold the ▽ key down for a while.
## B.3 Entering an Equation

When we show two or more buttons in a row, press them one at a time and in order.

To enter the equation $y = 2x + 1$,

1. Press $Y=.$
2. If necessary, press CLEAR to erase a previously entered equation.
3. Press $2 [X, T, Θ, n] + 1$. The screen will look like the one displayed in Fig. 1.
4. If you want to enter another equation, press ENTER. Then type in the next equation.
5. Use the $\Delta$ or $\bigtriangledown$ key to get from one equation to another.

![Figure 1 Entering an equation](image.png)

## B.4 Graphing an Equation

To graph the equation $y = 2x + 1$,

1. Enter the equation $y = 2x + 1$; see Section B.3.
2. Press $\lbrack \text{ZOOM} \rbrack 6$ to draw a graph of your equation between the values of $-10$ and $10$ for both $x$ and $y$.
3. See Section B.6 if you want to zoom in or zoom out to get another part of the graph to appear on the calculator screen. Or see Section B.7 to change the window format manually; then press GRAPH.

## B.5 Tracing a Curve without a Scattergram

To trace a curve, we find coordinates of points on the curve. To trace the line $y = 2x + 1$,

1. Graph $y = 2x + 1$ (see Section B.4).
2. Press TRACE.
3. If you see a flashing “*” on the curve, the coordinates of that point will be listed at the bottom of the screen. If you don’t see the flashing “*,” press ENTER and your calculator will adjust the viewing window so you can see it.
4. To find coordinates of points on your curve that are off to the right, press $\rightarrow$.
5. To find coordinates of points on your curve that are off to the left, press $\leftarrow$.
6. Find the $y$-coordinate of a point by entering the $x$-coordinate. For example, to find the $y$-coordinate of the point that has $x$-coordinate $3$, press $3$ ENTER. The screen will look like the one displayed in Fig. 2. This feature works for values of $x$ between Xmin and Xmax, inclusive (see Section B.7).
7. If more than one equation has been graphed, press $\bigtriangledown$ to trace the second equation. Continue pressing $\bigtriangledown$ to trace the third equation, and so on. Press $\lbrack \Delta \rbrack$ to return to the previous equation. Notice that the equation of the curve being traced is listed in the upper left corner of the screen.

![Figure 2 Tracing a curve](image.png)

## B.6 Zooming

The $\lbrack \text{ZOOM} \rbrack$ menu has several features that allow you to adjust the viewing window. Some of the features adjust the values of $x$ that are used in tracing.

- **Zoom In** magnifies the graph around the cursor location. The following instructions are for zooming in on the graph of $y = 2x + 1$:

1. Graph $y = 2x + 1$ (see Section B.4).
2. Press $\lbrack \text{ZOOM} \rbrack 2$. 

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B.7 Setting the Window Format

3. Use \(\text{\textless}\), \(\text{\textgreater}\), \(\text{\texttt{\&}}\), and \(\text{\texttt{\\lvert}}\) to position the cursor on the portion of the line that you want to zoom in on.

4. To zoom in, press \(\text{ENTER}\).

5. To zoom in on the graph again, you have two options:
   a. To zoom in at the same point, press \(\text{ENTER}\).
   b. To zoom in at a new point, move the cursor to the new point; then press \(\text{ENTER}\).

6. To return to your original graph, press \([\text{ZOOM}] 6\). Or zoom out (see the next instruction) the same number of times you zoomed in.

- **Zoom Out** does the reverse of Zoom In: It allows you to see more of a graph. To zoom out, follow the preceding instructions, but press \([\text{ZOOM}] 3\) instead of \([\text{ZOOM}] 2\) in step 2.

- **ZStandard** will change your viewing screen so both \(x\) and \(y\) will go from \(-10\) to 10.
   To use ZStandard, press \([\text{ZOOM}] 6\).

- **ZDecimal** lets you trace a curve by using the numbers 0, {0.1}, {0.2}, {0.3},... for \(x\). ZDecimal will change your viewing screen so \(x\) will go from \(-4.7\) to 4.7 and \(y\) will go from \(-3.1\) to 3.1. To use ZDecimal, press \([\text{ZOOM}] 4\).

- **ZInteger** allows you to trace a curve by using the numbers 0, {1}, {2}, {3},... for \(x\). ZInteger can be used for any viewing window, although it will change the view slightly. To use ZInteger, press \([\text{ZOOM}] 8\ enter\).

- **ZSquare** will change your viewing window so the spacing of the tick marks on the \(x\)-axis is the same as that on the \(y\)-axis. To use ZSquare, press \([\text{ZOOM}] 5\).

- **ZoomStat** will change your viewing window so you can see a scattergram of points that you have entered in the statistics editor. To use ZoomStat, press \([\text{ZOOM}] 9\).

- **ZoomFit** will adjust the dimensions of the \(y\)-axis to display as much of a curve as possible. The dimensions of the \(x\)-axis will remain unchanged. To use ZoomFit, press \([\text{ZOOM}] 0\).

---

**B.7 Setting the Window Format**

To graph the equation \(y = 2x + 1\) between the values of \(-2\) and \(3\) for \(x\) and between the values of \(-5\) and \(7\) for \(y\),

1. Enter the equation \(y = 2x + 1\) (see Section B.3).
2. Press \([\text{WINDOW}]\). Then change the window settings so the window looks like the one displayed in Fig. 3 after you have used steps 3–8.
3. Press \([\text{\textlangle}}] 2 \text{\textrangle} 2 \text{\texttt{\enter}}\) to set the smallest value of \(x\) to \(-2\).
4. Press \(3 \text{\texttt{\enter}}\) to set the largest value of \(x\) to \(3\).
5. Press \(1 \text{\texttt{\enter}}\) to set the scaling for the \(x\)-axis to increments of \(1\).
6. Press \([\text{\textlangle}}] 5 \text{\texttt{\enter}}\) to set the smallest value of \(y\) to \(-5\).
7. Press \(7 \text{\texttt{\enter}}\) to set the largest value of \(y\) to \(7\).
8. Press \(1 \text{\texttt{\enter}}\) to set the scaling for the \(y\)-axis to increments of \(1\).
9. Press \(\text{\texttt{\graph}}\) to view the graph of \(y = 2x + 1\). The screen will look like the graph drawn in Fig. 4.

![Figure 3 Window settings](image)

![Figure 4 Graph of \(y = 2x + 1\)](image)

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Appendix B
Using a TI-83 or TI-84 Graphing Calculator

B.8 Plotting Points in a Scattergram

To create a scattergram of the data displayed in Table 1,

1. To enter the data, press [STAT] 1.
2. If there are numbers listed in the first column (list L₁), clear the column by pressing ▼ as many times as necessary to get to column L₁. Next, press △ once to get to the top of column L₁. Then press CLEAR ENTER.
3. If there are numbers listed in the second column (list L₂), clear the column by pressing ▷ to move the cursor to column L₂. Then press △ CLEAR ENTER.
4. To return to the first entry position of list L₁, press ◁.
5. Press 2 ENTER 3 ENTER 4 ENTER 5 ENTER to enter the data in column L₁. (If you make a mistake, you can delete an entry by pressing DEL; then insert an entry by pressing 2nd [DEL].)
6. Press ▷ to move to the first entry position of list L₂.
7. Press 4 ENTER 7 ENTER 10 ENTER 11 ENTER to enter the elements of L₂.
8. Press 2nd [STAT PLOT].
9. Press 1 to select Plot 1.
10. Press ENTER to turn Plot 1 on.
11. Press ▼ ENTER to choose the scattergram mode.
12. Press ▼ so the cursor is at “Xlist.” Then press 2nd [L₁].
13. Press ▼ so the cursor is at “Ylist.” Then press 2nd [L₂].
14. Use squares, plus signs, or dots to represent the points plotted on the scattergram. These three symbols are called “Marks.” Press ▼ once so the cursor is on one of the three Mark symbols. Next, press ▷ and/or ◁ to select a symbol. Then press ENTER. The screen will look like the one displayed in Fig. 5.
15. Press ZOOM 9. The screen will look like the one displayed in Fig. 6.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Creating a Scattergram</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>y</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
</tr>
</tbody>
</table>

Make sure you press CLEAR rather than DEL. If you press DEL, the column will vanish. If you ever do this by mistake, press STAT 5 ENTER to get back the missing column.

If Plot 1 is off, your points will be saved in columns L₁ and L₂, but they will not be plotted.

B.9 Tracing a Scattergram

To see the coordinates of a point in a scattergram,

1. Draw a scattergram (see Section B.8).
2. Press TRACE.
3. Notice the flashing “×” on one of the points of the scattergram. The coordinates of this point are listed at the bottom of the screen.
4. To find the coordinates of the next point to the right, press ▷.
5. To find the coordinates of the next point to the left, press ◁.
B.10 Graphing Equations with a Scattergram

To graph the equation \( y = 2x + 1 \) with a scattergram of the data displayed in Table 2,

1. Enter the equation \( y = 2x + 1 \) (see Section B.3).
2. Follow the instructions in Section B.8 to draw the scattergram. (The graph of the equation will also be drawn, because you turned the equation on.) The screen will look like the one displayed in Fig. 7.

![Figure 7 Graphing an equation and a scattergram](image)

Table 2 Creating a Scattergram

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
</tr>
</tbody>
</table>

Recall from Section B.5 that if you do not see the flashing “\*,” press ENTER, and the calculator will adjust the viewing window so you can see it.

B.11 Tracing a Curve with a Scattergram

To trace a curve with a scattergram,

1. Graph an equation with a scattergram (see Section B.10).
2. Press [TRACE] to trace points that make up the scattergram. Press [TRACE] [▼] to trace points that lie on the curve. If other equations are graphed, continue pressing [▼] to trace the second equation, and so on. Press [△] to begin to return to the scattergram. Notice that the label “P:\(L_1, L_2\)” is in the upper left corner of the screen when Plot 1’s points are being traced and that the equation entered in the [Y=] mode is listed in the upper left corner of the screen when the curve is being traced.

Recall from Section B.5 that if you do not see the flashing “\*,” press ENTER, and the calculator will adjust the viewing window so you can see it.

B.12 Turning a Plotter On or Off

To change the on/off status of the plotter,

1. Press [Y=].
2. Press △. A flashing rectangle will be on “Plot 1.”
3. Press □ if necessary to move the flashing rectangle to the plotter you wish to turn on or off.
4. Press [ENTER] to turn your plotter on or off. The plotter is on if the plotter icon is highlighted.

B.13 Creating a Table

To create a table of ordered pairs for the equation \( y = 2x + 1 \), where the values of \( x \) are 3, 4, 5, \ldots (see Fig. 8),

1. Enter the equation \( y = 2x + 1 \) for \( Y_1 \) (see Section B.3).
2. Press [2nd] [TBLSET].
3. Press 3 [ENTER] to tell the calculator that the first \( x \) value in your table is 3.
4. Press 1 [ENTER] to tell the calculator that the \( x \) values in your table increase by 1.
5. Press [ENTER] [▼] [ENTER] to highlight “Auto” for both “Indpt” and “Depend.” The screen will now look like the one displayed in Fig. 9.
6. Press [2nd] [TABLE] to create the table shown in Fig. 8.
B.14 Creating a Table for Two Equations

To create a table of ordered pairs for the equations $y = 2x + 1$ and $y = -2x + 7$, where the values of $x$ are 3, 4, 5, . . . (see Fig. 10),

1. Enter the equation $y = 2x + 1$ for $Y_1$, and enter the equation $y = -2x + 7$ for $Y_2$ (see Section B.3).
2. Follow steps 2–5 of Section B.13.

![Table for two equations](image)

B.15 Using “Ask” in a Table

To use the Ask option in the Table Setup mode to complete Table 3 for $y = 2x + 1$,

1. Enter the equation $y = 2x + 1$ for $Y_1$ (see Section B.3).
2. Press 2nd [TBLSET].
3. Press ENTER twice. Next, press ▷. Then press ENTER. The Ask option for “Indpnt” will now be highlighted. Make sure the Auto option for “Depend” is highlighted.
4. Press 2nd [TABLE].
5. Press 2 ENTER 2.9 ENTER 5.354 ENTER 7 ENTER 100 ENTER. The screen will now look like the one displayed in Fig. 11.

![Using “Ask” for a table](image)

B.16 Finding the Regression Curve for Some Data

To find the regression line for the data displayed in Table 4,

1. See Section B.8 to create a scattergram of the data in Table 4. Enter your data in the first two columns ($L_1$ and $L_2$) of the STAT list editor.
2. Clear the Home Screen by pressing 2nd [QUIT] CLEAR.
3. Press STAT.
4. To choose the CALC menu, press ▷. The screen should look like the one displayed in Fig. 12.
5. To choose Linear Regression, press 4. The screen should now look like the one displayed in Fig. 13. (You can choose Quadratic Regression by pressing 5, Exponential Regression by pressing 0, or Power Regression by pressing ALPHA [A].)
B.17 Plotting Points in Two Scattergrams

It is possible to draw two scattergrams on the same calculator screen and use different markings for the two sets of points. To begin, follow the instructions in Section B.8 to create a scattergram of the data values in Table 5.

These data are stored in columns \( L_1 \) and \( L_2 \). The points are plotted by the plotter called “Plot 1.”

You will now create a scattergram of the data values in Table 6.

These data will be stored in columns \( L_3 \) and \( L_4 \). The points will be plotted by the plotter called “Plot 2.” To do this,

1. To enter the data, press \( \text{STAT} \) 1.
2. To clear list \( L_3 \), press \( \blacktriangleright \) and/or \( \blacktriangleleft \) to move the cursor to column \( L_3 \). Then press \( \blacktriangledown \) \( \text{CLEAR} \) \( \text{ENTER} \).
3. To clear list \( L_4 \), press \( \blacktriangleright \) to move the cursor to column \( L_4 \). Then press \( \blacktriangledown \) \( \text{CLEAR} \) \( \text{ENTER} \).
4. To return to the first entry position of list \( L_3 \), press \( \blacktriangleright \).
5. Press \( 2 \) \( \text{ENTER} \) \( 2 \) \( \text{ENTER} \) \( 3 \) \( \text{ENTER} \) \( 5 \) \( \text{ENTER} \) to enter the elements of \( L_3 \).
6. Press \( \blacktriangleright \) to move to the first entry position of list \( L_4 \).
7. Press \( 11 \) \( \text{ENTER} \) \( 9 \) \( \text{ENTER} \) \( 6 \) \( \text{ENTER} \) \( 4 \) \( \text{ENTER} \) to enter the elements of \( L_4 \).
8. Press \( 2 \) \( \text{nd} \) \( \text{[STAT PLOT]} \).
9. Press \( 2 \) to select “Plot 2.”
10. Press \( \text{ENTER} \) to turn Plot 2 on.
11. Press \( \bigcirc \) twice so the cursor is at “Xlist.” Then press \( \text{2} \) \( \text{nd} \) \( [L_3] \).
12. Press \( \text{ENTER} \) so the cursor is at “Ylist.” Then press \( \text{2} \) \( \text{nd} \) \( [L_4] \).

6. Press \( \text{ENTER} \). The screen should now look like the one displayed in Fig. 14. This means the equation of the regression line is \( y = 2.4x - 0.4 \).

To draw a graph of the regression line, you may either enter the equation manually (see Section B.3) or use the command

\[
\text{LinReg}(ax + b)L_1, L_2, Y_1
\]

which saves the equation to \( Y_1 \). Here are the keystrokes:

1. Follow the earlier instructions to get “LinReg(ax + b)” on your screen.
2. Press \( \text{2} \) \( \text{nd} \) \( [L_1] \) \( \text{2} \) \( \text{nd} \) \( [L_2] \) \( \text{ENTER} \).
3. Press \( \text{VARS} \) \( \bigtriangledown \) \( 1 \) \( \text{ENTER} \) The screen should look like the one displayed in Fig. 15.
4. Press \( \text{ENTER} \). The screen should now look like the one displayed in Fig. 14. In addition, if you press \( Y= \), the screen will look like the one displayed in Fig. 16.

Figure 14 The equation

Figure 15 About to save the equation to \( Y_1 \)

Figure 16 The equation is saved in \( Y_1 \)
13. Press $\bold{\downarrow}$ once so the cursor is on one of the three choices for “Mark.” Next, press $\bold{\triangleright}$ and/or $\bold{\triangleleft}$ to select a symbol different from the one you used for the first scattergram. Then press $\bold{\text{ENTER}}$. The screen will look like the one in Fig. 17.

14. Press $\bold{\text{ZOOM}}$ $\bold{9}$ to obtain the two scattergrams with different symbols. The screen will look like the one displayed in Fig. 18.

### B.18 Finding the Intersection Point(s) of Two Curves

To find the intersection point of the lines $y = 2x + 1$ and $y = -2x + 7$,

1. Enter the equation $y = 2x + 1$ for $Y_1$, and enter the equation $y = -2x + 7$ for $Y_2$ (see Section B.3).

2. By zooming in or out or by changing the window settings, draw a graph of both curves so you can see an intersection point. For our example, press $\bold{\text{ZOOM}}$ $\bold{6}$.

3. Press $\bold{\text{2nd}}$ $[\text{CALC}]$. The screen will look like the one displayed in Fig. 19.

4. Press $\bold{5}$ to select “intersect.”

5. You will now see a flashing cursor on your first curve. If there is more than one intersection point on your display screen, move the cursor by pressing $\bold{\triangleleft}$ or $\bold{\triangleright}$ so it is much closer to the intersection point you want to find. The screen will look something like the one displayed in Fig. 20.

6. Press $\bold{\text{ENTER}}$ to put the cursor on the second curve. Press $\bold{\text{ENTER}}$ again to display “Guess?” Press $\bold{\text{ENTER}}$ once more. The screen will look like the one displayed in Fig. 21. The intersection point is $(1.5, 4)$.

### B.19 Finding the Minimum Point(s) or Maximum Point(s) of a Curve

To find the minimum point of the curve $y = x^2 - 3x + 1$,

1. Enter the equation $y = x^2 - 3x + 1$ (see Section B.3).

2. Use ZDecimal to draw a graph of the equation (see Section B.6).

3. Press $\bold{\text{2nd}}$ $[\text{CALC}]$.

4. Press $\bold{3}$ to select “minimum.”

5. Move the flashing cursor by pressing $\bold{\triangleleft}$ or $\bold{\triangleright}$ so it is to the left of the minimum point, and press $\bold{\text{ENTER}}$. 
6. Move the flashing cursor by pressing $\leftarrow$ or $\rightarrow$ so it is to the right of the minimum point, and press [ENTER].

7. Press [ENTER]. The calculator will display the coordinates of the minimum point—about (1.50, −1.25). See Fig. 22.

You can find the maximum point of a curve in a similar fashion, but press 4 to select the “maximum” option, rather than the “minimum” option, in step 4.

---

**B.20 Storing a Value**

It is possible to store a number as $x$ and then perform operations with $x$. For example, to find $(2 + 3)^2$,

1. Press 2 + 3 STO $\rightarrow$ X, T, Θ, n ENTER.
2. Press X, T, Θ, n $\rightarrow$ 2 ENTER The screen should now look like the one displayed in Fig. 23.

---

**B.21 Finding Any $x$-Intercepts of a Curve**

To find the $x$-intercept of the line $y = x − 2$,

1. Enter the equation $y = x − 2$ (see Section B.3).
2. Use ZDecimal to draw a graph of the equation (see Section B.6).
3. Press [2nd] [CALC].
4. Press 2 to choose the “zero” option.
5. Move the flashing cursor by pressing $\leftarrow$ or $\rightarrow$ so it is to the left of the $x$-intercept, and press [ENTER]. Or type a number between Xmin and the $x$-coordinate of the $x$-intercept, and press [ENTER].
6. Move the flashing cursor by pressing $\leftarrow$ or $\rightarrow$ so it is to the right of the $x$-intercept, and press [ENTER]. Or type a number between the $x$-coordinate of the $x$-intercept and Xmax, and press [ENTER].
7. Press [ENTER]. The screen will look like the one displayed in Fig. 24. The $x$-intercept is (2, 0).

---

**B.22 Turning an Equation On or Off**

You can graph an equation only if its equals sign is highlighted. (The equation is then “on”). Up to 10 equations can be graphed at one time. To change the on–off status of an equation,

1. Press Y=.
2. Move the cursor to the equation whose status you want to change.
3. Use $\leftarrow$ to place the cursor over the “$=$” sign of the equation.
4. Press [ENTER] to change the status.
B.23 Finding Coordinates of Points

To find the coordinates of particular points,
1. Press [GRAPH] to get into graphing mode.
2. Press [>] to get a cursor to appear on the screen. (If you cannot see the cursor, it is probably on one or both of the axes. If it is on an axis, you should still be able to see a small flashing dot.) Notice that the coordinates of the point where the cursor is currently positioned are at the bottom of the screen.
3. Use [<], [>], [▲], or [▼] to move the cursor left, right, up, or down, respectively.

B.24 Graphing Equations with Axes “Turned Off”

Suppose you want to draw a graph of \( y = 0 \). The axes will obscure the graph of \( y = 0 \). To graph without the axes appearing on the screen,
1. Enter the equation \( y = 0 \) for \( Y_1 \) (see Section B.3).
2. Press 2nd [FORMAT]. You are now at the FORMAT menu.
3. Press [▽] three times, then press [▷]; then press [ENTER] “AxesOff” should now be highlighted.
4. Use ZDecimal to have the screen appear like the one displayed in Fig. 25 (see Section B.6).

You can turn the axes back on by highlighting “AxesOn” in the FORMAT menu.

B.25 Entering an Equation by Using \( Y_n \) References

To enter the complicated equation \( y = \frac{x + 1}{x - 3} + \frac{x - 2}{x + 5} \) by using \( Y_n \) references,
1. Enter \( Y_1 = \frac{x + 1}{x - 3} \) and \( Y_2 = \frac{x - 2}{x + 5} \) (see Section B.3).
2. Turn both equations off (see Section B.22).
3. Move the flashing cursor to the right of “\( Y_3 = \)”
4. Press [VARS] [▽] [ENTER].
5. Move the cursor to “1:Y1” and press [ENTER]. “\( Y_1 \)” will now appear to the right of “\( Y_3 = \)” in the \( Y= \) window.
6. Press [▽].
7. Press [VARS] [▽] [ENTER].
8. Move the cursor to “2:Y2” and press [ENTER]. “\( Y_1/Y_2 \)” will now appear to the right of “\( Y_3 = \)” in the \( Y= \) window.

B.26 Responding to Error Messages

Here are several common error messages and how to respond to them:
• The Syntax error (see Fig. 26) means you have misplaced one or more parentheses, operations, or commas. The calculator will find this type of error if you choose “Goto” by pressing [▼], then [ENTER]. Your error will be highlighted by a flashing black rectangle.
The most common “Syntax” error is pressing \( @ \) when you should have pressed \( \text{-} \), or vice versa:

1. Press the \( @ \) key when you want to take the opposite of a number or are working with negative numbers. To compute \(-5(-2)\), press \( [ @ ] 5 [ @ ] 2 \).
2. Press the \( \text{-} \) key when you want to subtract two numbers. To compute \( 5 - 2 \), press \( 5 \ [ \text{-} ] 2 \).

- The **Invalid** error (see Fig. 27) means you have tried to enter an inappropriate number, expression, or command. The most common “Invalid” error is to try to enter a number that is not between Xmin and Xmax, inclusive, when you use a command such as \( \text{TRACE} \), “minimum,” or “maximum.”

- The **Invalid dimension** error (see Fig. 28) means you have the plotter turned on (see Fig. 29) but have not entered any data points in the STAT list editor (see Fig. 30). In this case, first press \( \text{ENTER} \) to exit the error message display; then either turn the plotter off or enter data in the STAT list editor.

- The **Dimension mismatch** error (see Fig. 31) is fixed in two ways:
  1. In the STAT list editor, one column you are using to plot has more numbers than the other column has (see Fig. 32). In this case, first press \( \text{ENTER} \) to exit the error message display; then add or delete numbers so the two columns have the same length.
  2. In the STAT list editor, one column you are using to plot has more numbers than the other column has, but you didn’t notice the difference in length because you deleted one or both of the columns by mistake. You can find the missing column(s) by pressing \( \text{STAT} 5 \ [\text{ENTER}] \).

- The **Window range** error (see Fig. 33) means one of two things:
  1. You made an error in setting up your window. This usually means you entered a larger number for \( Xmin \) than for \( Xmax \) or you entered a larger number for \( Ymin \) than for \( Ymax \). In this case, first press \( \text{ENTER} \) to exit the error message display; then change your window settings accordingly (see Section B.7).
  2. You pressed \( \text{ZOOM} 9 \) when only one data-point pair was entered in the STAT list editor. (On some TI graphing calculators, the command ZoomStat works only when you have two or more pairs of data points in the STAT list editor.) In
Appendix B  Using a TI-83 or TI-84 Graphing Calculator

this case, first press [ENTER] to exit the error message display; then either add more points to the STAT list editor or avoid pressing [ZOOM] 9 and set up your window settings manually (see Section B.7).

• The No sign change error (see Fig. 34) means one of two things:
  1. You are trying to locate a point that does not appear on the screen. For example, you may be trying to find an intersection point of two curves that intersect off-screen. Or you may be trying to find a zero of an equation that does not appear on the screen. In this case, press [ENTER] and change your window settings so the point you are trying to locate is on the screen.
  2. You are trying to locate a point that does not exist. For example, you may be trying to find an intersection point of two parallel lines. Or you may be trying to find a zero of an equation that does not have one. In this case, press [ENTER] and stop looking for the point that doesn’t exist!

• The Nonreal answer error (see Fig. 35) means your computation did not yield a real number. For example, \( \sqrt{-4} \) is not a real number. The calculator will locate this computation if you choose “Goto” by pressing [\( \sqrt{\} \)] then [ENTER].

• The Divide by 0 error (see Fig. 36) means you asked the calculator to perform a calculation that involves a division by zero. For example, \( 3 \div (5 - 5) \) will yield the error message shown in Fig. 36.

The calculator will locate the division by zero if you choose “Goto” by pressing [\( \sqrt{\} \)], then [ENTER].