

Tracey Rickert

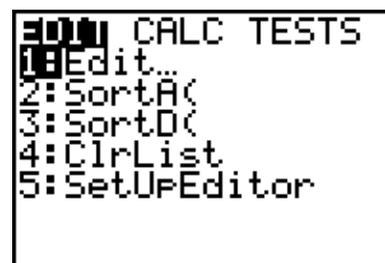
SEU 323

October 26, 2005

### GRAPHING CALCULATOR ACTIVITY

In this activity you will learn how to create and interpret a box-and-whisker plot by utilizing the TI-83 graphing calculator. A box-and-whisker plot is a graphical representation of a set of data from which you can read the following values: the minimum value in the set; the median; the maximum value; and the three quartiles of the data set. Follow each step in order to complete the exercise. The values you will work with are:     **28     34     22     26     30     32     25     33     27     36**

1. First you will prepare to enter the values of the data set into the calculator by putting the values into a **list**. Push the  $\text{\textcircled{2}}$  key; EDIT should be highlighted. This is the screen you should have before you continue:



Now push  $\text{\textcircled{2}}$      ◆select Edit from the drop down list. Multiple lists will be displayed on the screen; they will be labeled L<sub>1</sub>, L<sub>2</sub>, L<sub>3</sub>. We will work with L<sub>1</sub>. ( If any of the lists contain values in the columns, you will clear them. Using the arrow keys, arrow

to the top of the specific list so that  $L_1$ ,  $L_2$ , or  $L_3$  is highlighted. Push . The lists should contain no values.) The screen should look like this:

L1	L2	L3	1
████████	-----	-----	
L1(1) =			

2. You are now ready to enter the values into the list. Put the number in and press  $\text{↵}$  after each number. In the bottom left of the screen you will see the list name, the row number, and the value in that row. This is the screen you should have displayed:

L1	L2	L3	1
28	-----	-----	
34			
22			
26			
20			
22			
25			
L1(1) = 28			

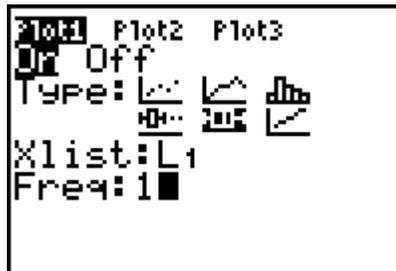
Not all of the values are displayed; the screen displays seven values at one time.

3. Now you will define the type of graph you want to use to display the data, a box-and-whisker plot. Quit the list screen:  $\text{⏏}$ . Go to STAT PLOT by using the keystrokes:  $\text{⏏}$ . This is the screen you should see:

STAT PLOT			
1	Plot1...On		
⏏	L1	1	
2	Plot2...Off		
⏏	L2	1	□
3	Plot3...Off		
⏏	L1	L2	□
4	PlotsOff		

We will work with Plot 1 and define the plot. On the screen “1” should be highlighted as it is on the above picture. Push  $\text{↵}$ . On this screen, only Plot 1 should be highlighted at the top. If it is not, use the up arrow to highlight “Plot 1” and hit  $\text{↵}$ . The first line turns the plot on. Push  $\text{↵}$  when “On” is flashing and then arrow down to the second line. Push  $\text{↵}$  when “On” is flashing and then arrow down to the second line.

Here we select the type of graph. Use the arrow keys to highlight box-and-whisker plot. This is the symbol: . Push  and arrow down to the next line. In the “X list” line you enter the list to be used to plot in the box-and-whisker plot. We entered our data into L<sub>1</sub>, so we enter it this way:  . It is located above the number 1 in yellow. Arrow down to the “Frequency” line. Here you will use the calculator default value, 1. Push  and the cursor will flash solid. Push . Your screen should look like this:

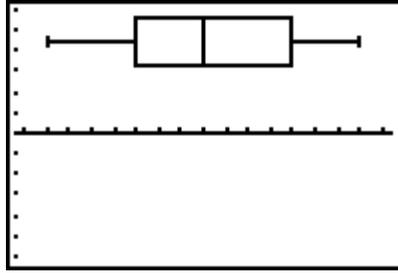


If you need to edit any lines, use the arrow keys to get to that line and make the changes. Quit this screen by pressing  . We have another way to check the status of Plot 1. Enter   for the STAT PLOT screen. Each plot is listed on the screen and it shows us that Plot 1 is on, box-and-whisker is the graph of choice, L<sub>1</sub> is the list storing the data, and the frequency is 1. All other plots are off. This is the screen:

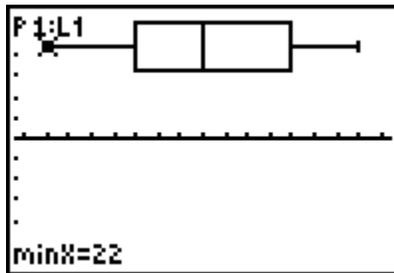


Quit this screen by again pressing  .

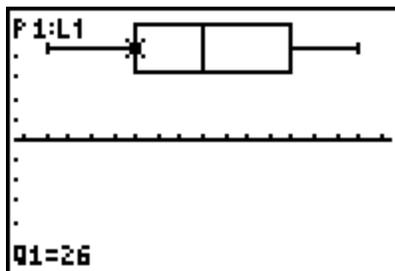
4. You are now ready to graph the box-and-whisker plot. Press  and use the down arrow until the cursor is on number 9, ZoomStat. Press . The box-and-whisker plot will be displayed. This is the graph:



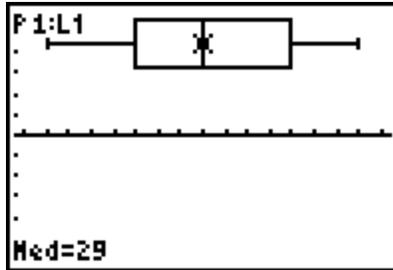
5. You can now explore the graph to learn what information is provided about the data set. Please record all of the values you find on the attached worksheet. Push  $\square$ . The cursor will appear on the box-and-whisker plot. Using the left arrow key, arrow to the left until min X is displayed in the lower left hand side of the screen and the cursor is on the left “whisker” of the plot. Record this value. This is the screen:



Arrow right and you will see displayed the value of  $Q_1$ , or the first quartile. Record this value. This is the screen:

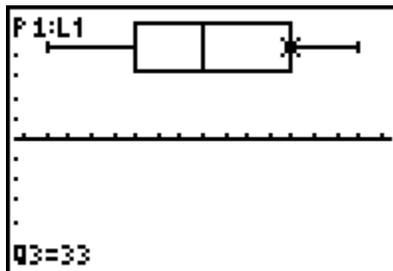


Arrow once to the right and the cursor will be on the median value as it is displayed in the bottom left corner of the screen. Please record the value. This is the screen:

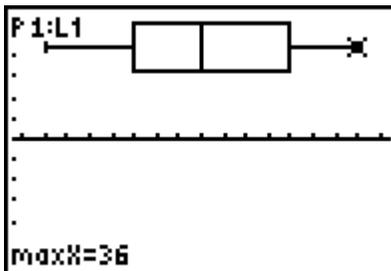


Arrow again to the right and the cursor is on  $Q_3$ , or the third quartile. Record the value.

This is the screen:



Arrow to the right and the cursor will be on the maximum value of the data set on the right “whisker” and the value is displayed in the bottom left of the screen. Record the value. This is the screen:



The graphing calculator allows us to investigate a data set and find specific values without performing any calculations via the box-and-whisker plot. These values include the minimum value,  $Q_1$ , the median,  $Q_3$ , and the maximum value. The accuracy of the initial steps is important for a correct graphical representation and in turn correct values for the data set’s characteristics.



## GRAPHING CALCULATOR ACTIVITY WORKSHEET

### Part I:

Directions: Record the following values from the graphing activity you just completed.

**Minimum Value:** 22

**Median:** 29

**$Q_1$ :** 26

**$Q_3$ :** 33

**Maximum Value:** 36

### Part II:

Directions: Answer the following questions:

1. By looking at the box-and-whisker plot, what is  $Q_1$  in relation to the minimum value and the median?

It is the median value between the minimum and the median of the data set.

2. By looking at the box-and-whisker plot, what is  $Q_3$  in relation to the median and the maximum value?

It is the median value between the data set's median and the maximum.

3. You have  $Q_1$  and you have  $Q_3$ . What is  $Q_2$ ?

It is the data set's median.

**Part III:**

Use the following data set: 36 44 46 35 41 40 39 42

Enter the values into a list, graph a box-and-whisker plot, and find the minimum value,  $Q_1$ , median,  $Q_3$ , and maximum value.

**Minimum Value:** 35

**Median:** 40.5

**$Q_1$ :** 37.5

**$Q_3$ :** 43

**Maximum Value:** 46

