# Exploring the *TI-73 Explorer*
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The fraction modes and features and the qualitative date features make the TI-73 Explorer useful in teaching developmental mathematics courses and introductory statistics courses, respectively. The fraction modes and features are particularly helpful to students who are either learning or relearning how to work with fractions since the manual mode allows the student to explore fractions at her/his own pace while providing guidance in the form of information about common factors and intermediate and final values for any fraction calculation that (s)he may wish to explore. The qualitative data features allow one to explore qualitative data with up to seven (7) values using bar graphs, pictographs, and pie charts. These features are also helpful for illustrating and working with percentages. Although the variety of statistics functions and tests available on the TI-83, TI-83+, TI-84, and TI-84+ are not available on the TI-73 Explorer, the qualitative data features, the 1- and 2-variable statistics, linear, quadratic, and exponential regression and manual fit for (approximately) linear data make TI-73 Explorer a helpful tool in teaching and demonstrating concepts discussed in introductory statistics courses.

Let us begin our exploration with a unique recall feature of the TI-73 Explorer. As with all TI-calculators, we can use the key sequence 2nd and (-) to access ANS, the last calculated value commonly referred to as the *last answer*, and recall a sequence of last entries using the key sequence 2nd and ENTER to access ENTRY, the last expression(s) executed by the calculator and commonly referred to as the *last entry*, but, with the TI-73 Explorer, we can us the up arrow and down arrow keys to scroll on the calculator screen to view, select, recall, and execute any one of the last entries, limited only by the available memory of the calculator. Figures 1, 2, and 3 below provide illustration of how one can move along the screen, upward in this case, to access previously executed calculated values. Figures 4, 5, and 6 below
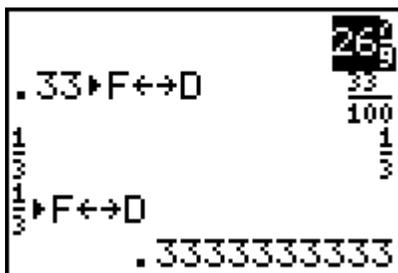
Figure 1: Accessing final answers through one screen.
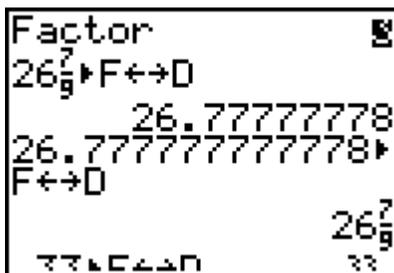
Figure 2: Accessing final answers through a second screen.
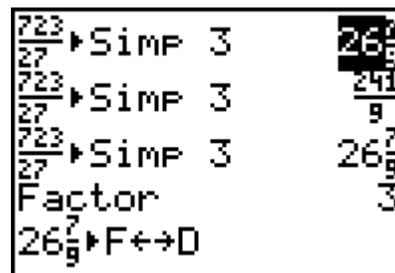
Figure 3: Accessing final answers through a third screen.

provide illustration of how one can move along the screen, upward, again, in this case, to access previously executed commands even beyond expressions that resulted in an error and to expressions that might be missing a right-hand parenthesis, for example. Once we have found the expression that we would like to reuse, we can press enter to place it on the current line for use as part of a new expression or to execute again.

Figure 4: Accessing expressions through one screen.
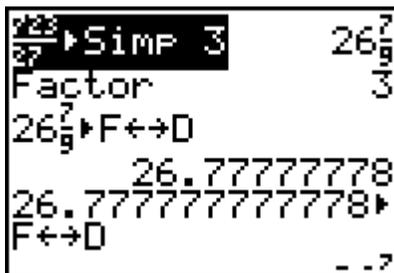
Figure 5: Accessing expressions through a second screen.
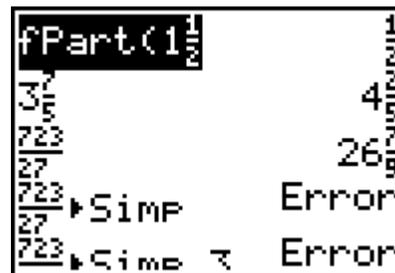
Figure 6: Accessing expressions through a third screen past expressions that resulted in errors.

Of course, now that you have viewed the fractions in Figures 1 – 6 above, you know that the TI-73 Explorer uses both standard fraction notation for both proper and improper fractions as well as standard compound fraction or, if you prefer, mixed number notation. The UNIT, b/c, $F \leftrightarrow D$, and $A\frac{b}{c} \leftrightarrow \frac{d}{e}$ keys, the first, second, third, and fourth keys of the fourth row of keys from the top, allow one to enter fractions, to change notations from fraction to decimal and from decimal to fraction, and to change from compound fraction and improper fraction and from improper fraction to compound fraction In addition, we can use fractions in a automatic simplification mode and a manual simplification mode. Let us begin our examination of fractions by examining the modes. Pressing the MODE button to the left of the yellow 2nd button in the top row of calculator buttons, we can, as with other TI calculators, change the numeric mode from Normal to Scientific Notation, change from Floating Point to displaying a fixed number of decimal places, and select the measure for angles, Degrees or Radians. The TI-73 Explorer has a mode for displaying fractions, using mixed number format or simple fraction format as well as a mode for automatic simplification or manual simplification of fractions, Figure 7.

Let us begin by exploring fractions using the automatic simplification mode: to use mixed number format for fractions, we move the cursor to the mixed number notation, A␣b/c, and press ENTER, Figure 7, and to use simple fraction notation, we move the cursor to b/c and press ENTER, Figure 8; to exit the display mode menu, we press the key sequence 2nd MODE, generating QUIT and returning the display to the home screen.
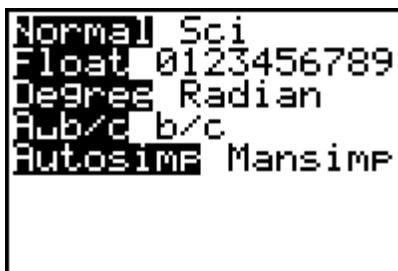

Figure 7: The display modes with mixed number notation and automatic simplification modes selected.
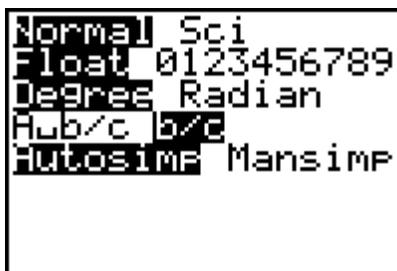
Figure 8: The display modes with simple fraction notation and automatic simplification modes selected.
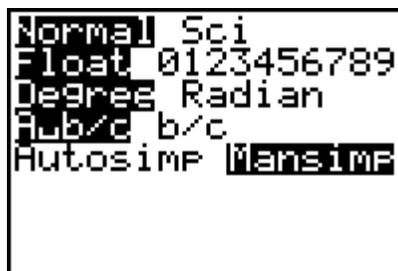
Figure 9: The display modes with mixed number notation and manual simplification modes selected.

To enter simple fraction notation, we press the b/c button: the simple fraction notation is generated and the cursor is position in the numerator, Figure 11. We enter the digit(s) for the numerator and then press either the down arrow or the right arrow to move to the denominator. We can quickly generate the same notation by first entering the digit(s) for the numerator and then pressing the b/c button and directly entering the digit(s) for the denominator.
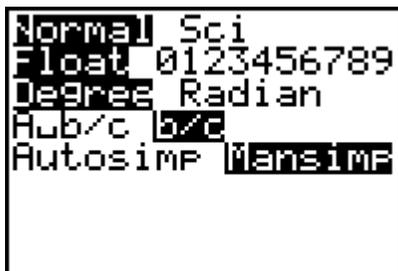
Figure 10: The display modes with simple fraction notation and manual simplification modes selected.

Figure 11: Generation of a fraction using simple fraction notation using the b/c button: ready to enter the numerator..


Figure 12: Generation of the fraction using simple fraction notation using the b/c button: ready to enter the denominator.

In order to explore the automatic simplification mode as well as the mixed number display, we will enter a numerator of 25, Figure 12, and a denominator of 4, Figure 13. Pressing ENTER, Figure 14, we see that the calculator *automatically* re-expresses the improper fraction as a mixed number.

Since the calculator is set in automatic simplification mode and set to display fractions as mixed numbers, our fraction, $\dfrac{25}{4}$, is automatically simplified to be expressed as $6\dfrac{1}{4}$, Figure 14; the fraction, $\dfrac{25}{4}$, for which the numerator and denominator are relatively prime is expressed as a mixed number since we have set the calculator to automatically simplify fractions and we have selected the mixed number display mode.

If we enter an improper fraction for which the numerator and denominator are not relatively prime then the fraction will not only be automatically re-expressed as a mixed number but also automatically completely reduced. To see this, let us consider the fraction, $\dfrac{300}{48}$, for which the numerator and the denominator

Figure 13: The completed fraction displayed on the screen.
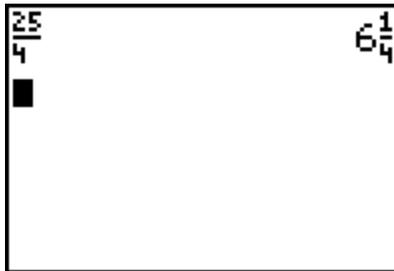
Figure 14: The fraction automatically re-expressed as a mixed number when we press ENTER.
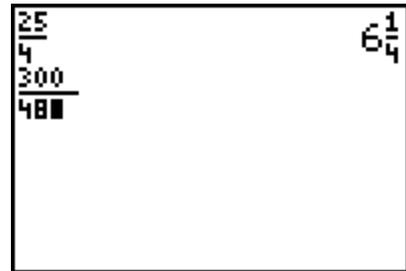
Figure 15: Entering the improper fraction, $\dfrac{300}{48}$, for which the numerator and denominator have a common factor of 12.

have a common factor of 12. Again, we use the b/c button to enter the fraction, entering the digits for the numerator first, pressing the b/c button, and then typing the digits for the denominator, Figure 15; this is the quickest of the ways in which to enter the simple fraction but either method for entering the fraction can be used. Pressing ENTER, we find that our fraction, $\dfrac{300}{48}$, is automatically reduced to $6\dfrac{1}{4}$, Figure 16.

Figure 16: The improper fraction, $\dfrac{300}{48}$, automatically reduced to $6\dfrac{1}{4}$.
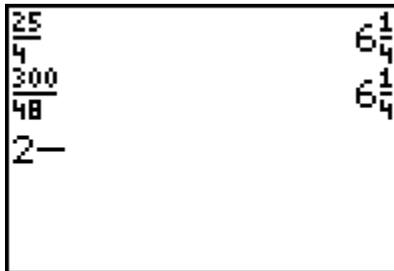
Figure 17: The whole number entered.

Figure 18: The whole number and the numerator for the simple fraction entered.

In order to enter a fraction expressed as a mixed number, we use both the UNIT button and the b/c button: we use the UNIT button to enter the whole number and the b/c button to enter the fraction. We can use these in combination to enter simplified mixed numbers as well as mixed numbers that need to be simplified. Since the former is straight forward, let us explore the latter by entering the mixed number $2\frac{28}{70}$. We enter the whole number, 2, press the UNIT button, Figure 17, enter the numerator for the
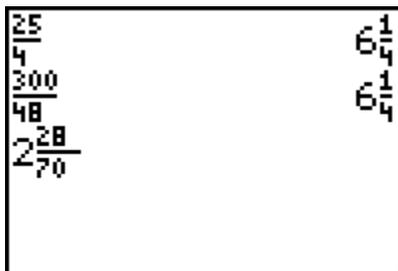
Figure 19: The whole number and the completed simple fraction entered to create the entire mixed number.
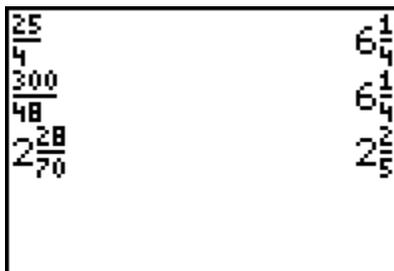
Figure 20: The mixed number automatically simplified.
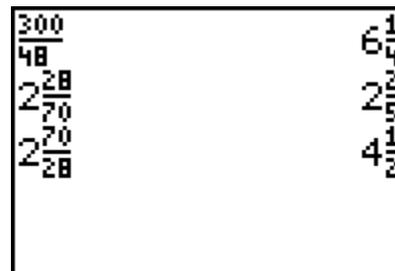
Figure 21: The mixed number, $2\frac{70}{28}$, automatically simplified to $4\frac{1}{2}$.

simple fraction, 28, press the b/c button, Figure 18, and enter the denominator, 70, Figure 19. Pressing ENTER, automatically simplifies the fraction while keeping the fraction expressed as a mixed number.

If we enter the mixed number $2\frac{70}{28}$ and press ENTER, we find the entire fraction is automatically simplified to $4\frac{1}{2}$, Figure 21.

Changing the display mode from mixed number to simple fraction, Figure 8, we find that completely reduced simple fractions, whether proper, Figure 22, or improper, Figure 23, will remain the same.

Figure 22: The completely reduced simple fraction.

Figure 23: The completely reduced improper fraction.
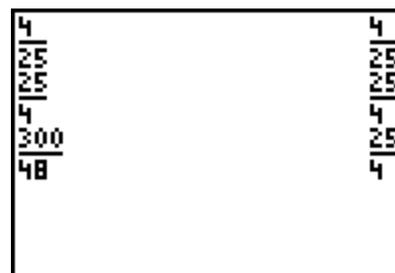
Figure 24: The improper fraction for which the numerator and denominator have a common factor of 12.

However, if we enter an improper fraction for which the numerator and denominator are not relatively prime then the TI-73 Explorer, set in automatic simplification mode, will automatically simplify the fraction while maintaining the format as a simple fraction. To see this, we enter the improper fraction $\frac{300}{48}$ for

which the numerator and denominator have a common factor of 12. Pressing ENTER, we find that our fraction is simplified to $\dfrac{25}{4}$, Figure 24.

If we wanted to use either a mixed number or a simple fraction in a calculation then we would use the right arrow to move out of the fraction and then enter the rest of the expression as we would normally. While we can use either the mixed number or simple fraction format for calculations or display of the calculated value, it is important to remember that our desired expression may necessitate the use of parentheses.

Using the manual simplification mode with either the mixed number display, Figure 9, or the simple fraction display, Figure 10, we can instruct the calculator to perform the simplification operations one step at a time until the fraction has been completely simplified. To explore the manual simplification mode, settings as is Figure 10, let us consider the fraction $\dfrac{300}{48}$; as before, we enter the fraction by typing the numerator, 300, pressing the b/c button, and then typing the denominator 48 or by moving the cursor up to the fraction $\dfrac{300}{48}$ and pressing ENTER to bring this expression to the current executable line. Since
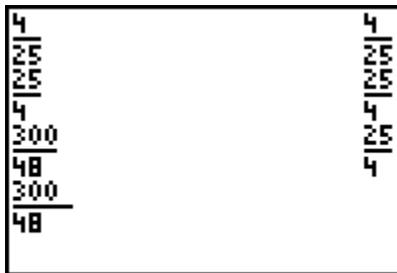
Figure 25: Ready to simplify the fraction $\dfrac{300}{48}$ manually.
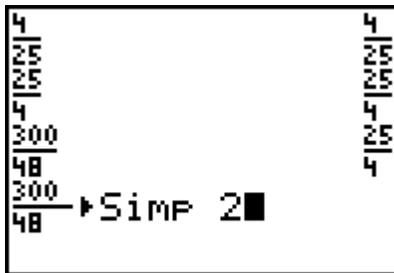
Figure 26: Ready to reduce the numerator and denominator of the fraction $\dfrac{300}{48}$ by a factor of 2.
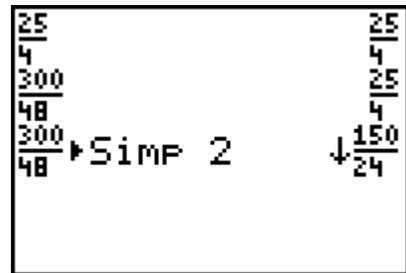
Figure 27: Ready to reduce the fraction further.

the numerator and the denominator of our fraction are even, we may want to reduce by a factor of 2. To do this, we use the SIMP button and type 2, Figure 26. That is, SIMP 2 instructs the calculator to reduce the numerator and denominator of the fraction by a factor of 2: SIMP 2 is the notation for the simplification factor of 2 by which the numerator and denominator will be reduced. Pressing ENTER, our fraction is reduced by a factor of 2 in both the numerator and the denominator, and we notice that there is
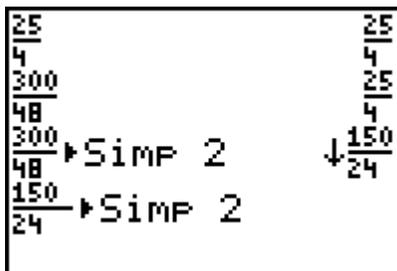
Figure 28: The fraction ready to be reduced by a second factor of 2.
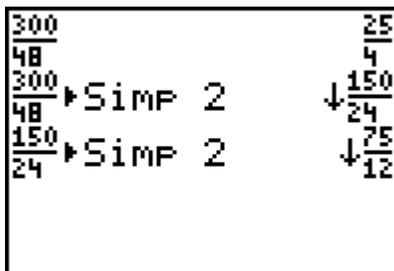
Figure 29: The fraction reduced by a second factor of 2.
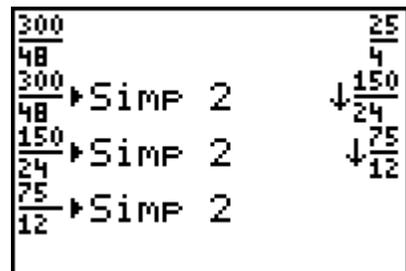
Figure 30: The fraction ready to be reduced by a third factor of 2.

a downward arrow in front of the new fraction, $\downarrow \dfrac{150}{24}$. This downward arrow indicates that the fraction can be reduced further. So, since both the numerator and denominator are still even, we can reduce by another factor of 2, Figure 28. Pressing SIMP, we see that our fraction, $\dfrac{150}{24}$, is automatically displayed, Figure 28. Pressing ENTER, Figure 29, our fraction is reduced by a second common factor of 2 in the numerator and the denominator.
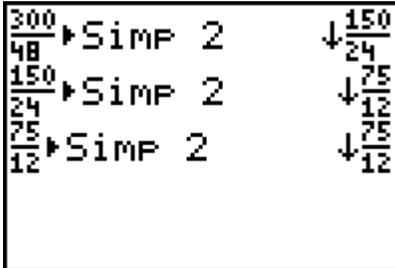

Figure 31: The fraction has at least one additional common factor in the numerator and the denominator but this common factor is not a 2.
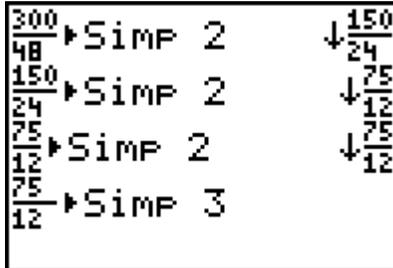
Figure 32: The fraction ready to be reduced by a factor of 3 in the numerator and the denominator.
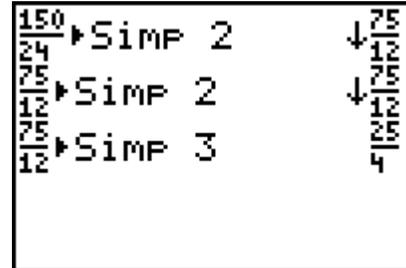
Figure 33: The completely reduced fraction.

If we did not notice that the resulting fraction, $\dfrac{75}{12}$, does not have any additional common factors of 2, we might try to reduce by 2 again, Figure 30. Let us see what happens! Pressing ENTER, we see that the same fraction, $\dfrac{75}{12}$, is displayed together with the downward arrow. So, while our fraction no longer has any common factors of 2 in the numerator and denominator, there is at least one more common factor in both the numerator and denominator; of course, our common factor is 3. So, let us reduce by this common factor of 3, Figure 32. Pressing ENTER, our fraction is reduced by the common factor of 3 in the numerator and the denominator, $\dfrac{25}{4}$, and we know that the fraction has been completely reduced since the is fraction is not preceded by the downward arrow, $\downarrow$, Figure 33.
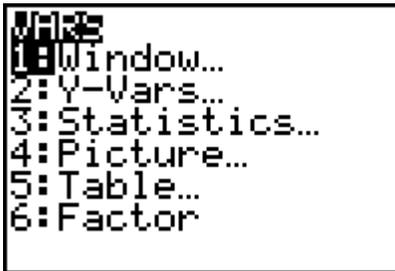
Figure 34: The Factor entry on the VARS menu.
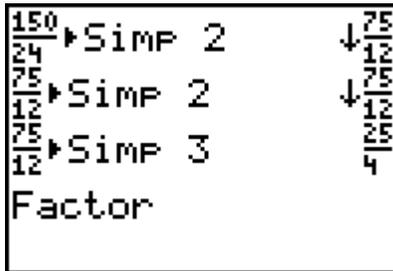
Figure 35: Pressing 6 or moving the cursor to the sixth entry and pressing ENTER, allows us to display the simplification factor entry on the home screen.
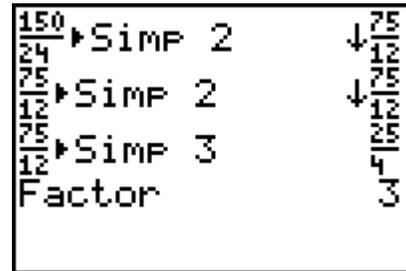
**Figure 36:** Pressing ENTER displays the stored simplification factor.

Suppose after all this work, we want to determine what the last simplification factor is; while, in our case, we can view the last simplification factor on the screen, one might have want to use this simplification factor in a calculation or as part of a function. The TI-73 Explorer stores the last simplification factor in

memory; the previous simplification factors are not saved in memory, only the last simplification factor. The simplification factor is entry 6 on the VARS menu, Figure 34: we press 2nd and the APPS button to access the VARS menu. Moving the cursor to the sixth entry on the VARS menu using the up and/or down arrow or simply pressing 6 displays Factor on the home screen, Figure 35. Pressing ENTER, executes Factor, displaying the last simplification factor, 3, on the screen, Figure 36.

It is important to mention that the simplification factor is a positive integer. If you enter a negative integer, zero, a decimal value or a fraction, you will generate an error. For the negative number and the fraction, this error will occur whether or not you use parentheses.
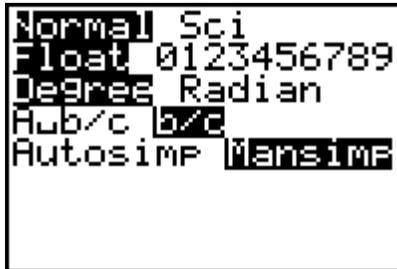

Figure 37: The calculator set in manual simplification mode with simple fraction display.
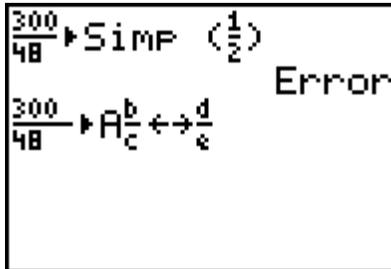
Figure 38: Converting the simple fraction to a compound fraction.
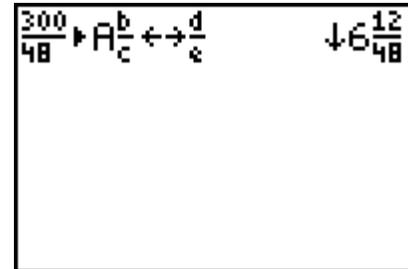
Figure 39: The compound fraction that must be reduced.

The F↔D button and the $A\frac{b}{c} \leftrightarrow \frac{d}{e}$ buttons change the display between fraction and decimal and mixed and simple fractions, respectively. The latter button, $A\frac{b}{c} \leftrightarrow \frac{d}{e}$, is not dependent on the display mode. That is, if the display mode is set as simple fraction, the fraction can be expressed as a mixed number by pressing $A\frac{b}{c} \leftrightarrow \frac{d}{e}$. Since our last exploration had our calculator set in manual simplification mode with simple fraction display mode, Figure 37, let us keep the calculator in this mode and see what happens to our last fraction, $\frac{300}{48}$, when we press $A\frac{b}{c} \leftrightarrow \frac{d}{e}$, Figure 38; recall, that we may use the up/down arrows to scroll among the previously executed operations and calculated values, selecting the desired value or
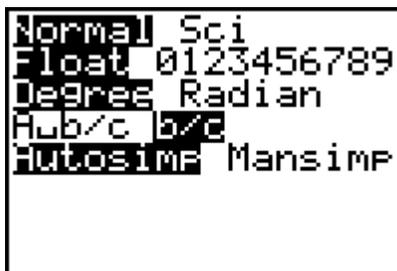
Figure 40: Automatic simplification mode with simple fraction display.
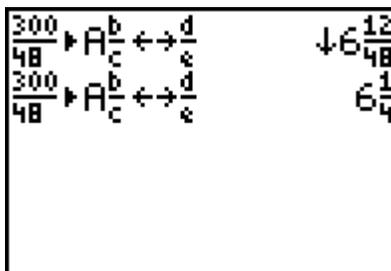
Figure 41: The completely reduced compound fraction produced when in automatic simplification mode.
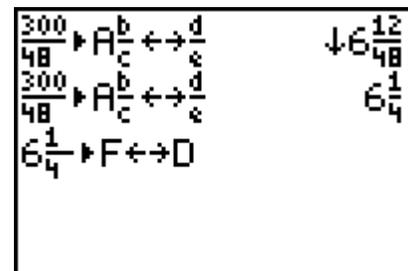
**Figure 42:** Expressing our compound fraction as a decimal.

expression by pressing ENTER. With $\frac{300}{48}$ entered on the screen followed by $A\frac{b}{c} \leftrightarrow \frac{d}{e}$, obtained by pressing the corresponding button in the fourth row of buttons from the top of the calculator, pressing

enter produces the compound fraction $6\frac{12}{48}$, Figure 39, with the down arrow, ↓, indicating that the fraction must be reduced. If we had set the calculator in automatic simplification mode, Figure 40, but keep the display mode as simple fraction, our $\frac{300}{48}\,A\frac{b}{c}\leftrightarrow\frac{d}{e}$ key-sequence will produce a completely reduced mixed number $6\frac{1}{4}$, Figure 41.
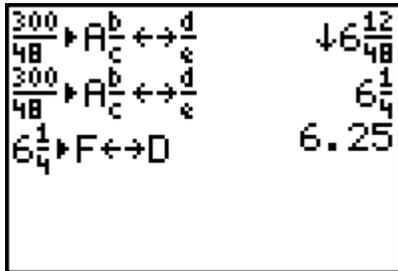
Figure 43: The fraction, $6\frac{1}{4}$, expressed as a decimal, 6.25.
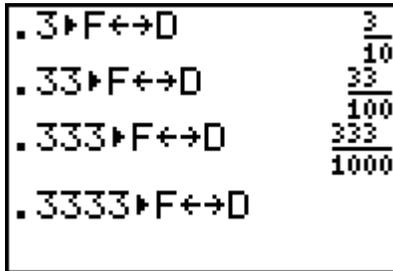
Figure 44: Messing around with decimals: .3, .33, .333, and .3333.
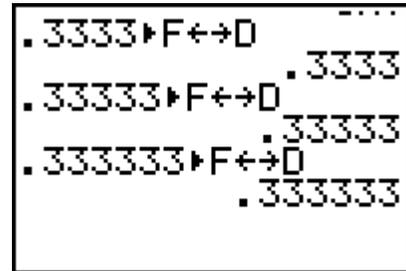
Figure 45: Messing around with more decimals: .3333 (continued), .33333, and .333333.

Since we have a compound fraction, let us use the $F\leftrightarrow D$ button to re-express our fraction as a decimal. To do this, we can simply press $F\leftrightarrow D$, since we want to express the fraction in the previous operation as a decimal. If we wanted to express a different fraction as a decimal then we would need to enter the fraction before we press the $F\leftrightarrow D$ button; think of this button as the fraction-to-decimal or decimal-to-fraction button depending on to what form you would like to convert the original number. So, having entered our expression on the home screen, Figure 42, we press ENTER to express our fraction as a decimal, Figure 43.
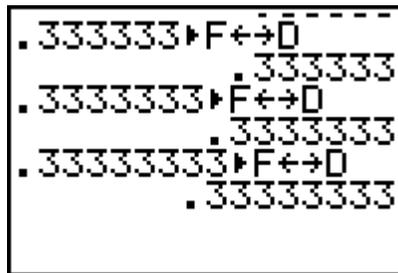
Figure 46: Messing around with more decimals: .333333 (repeated for continuity), .3333333, and .33333333.
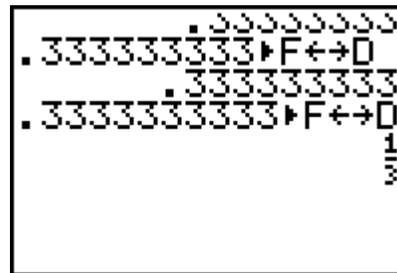
Figure 47: Messing around with even more decimals (well, two more): .333333333 and .3333333333.

Examining Figures 44, 45, 46, and 47, we find that the decimals 0.3, 0.33, and 0.333 are expressed as the fractions $\frac{3}{10}$, $\frac{33}{100}$, and $\frac{333}{1000}$, respectively, while 0.3333, 0.33333, 0.333333, 0.3333333, 0.33333333, and 0.333333333 are returned as decimals before 0.3333333333 is returned as $\frac{1}{3}$. Hmm, point to ponder: is 0.3333333333 the same as $\frac{1}{3}$?   ;)

Well, now that we have played with the fraction features for eight pages, let us turn our focus to working with categorical or, if you prefer, qualitative data. The easiest way in which to enter data lists is by using the list editor; the list editor acts as a spreadsheet for the calculator. In order to indicate that a list that we are entering in the calculator contains qualitative data, we enter the first data value of the categorical list within quotes.

Unlike the other TI calculators, the text elements are stored within the TEXT menu, Figure 48, accessed using the key sequence 2nd and MATH (the button directly below the yellow 2nd button): the text elements are not displayed above the calculator's keys. It is important to note that the braces are within the TEXT menu as well.

Figure 48: The TEXT menu.

To access elements within the TEXT menu, we use the arrows to more horizontally or vertically and the ENTER button to select the letters; the comma is on the button directly above the STO key which directly above the ON button. As you select and press ENTER while creating the strings (of characters) that you need, you will notice that if you enter any extraneous characters that you cannot delete them within the TEXT menu; once you have exited the TEXT menu, you can use the arrow keys and the DEL (delete) key to delete them. In addition, if you need to add any characters, position the cursor at the point at which you would like to add the missing character, press the INS (insert) key using the key sequence 2nd and DEL, and then enter the TEXT menu to access the needed/desired letter(s).

While we can enter and analyze data for a qualitative variable with more than seven (7) values, we cannot create a bar graph, a pictograph, or a pie chart if the variable has more than seven data values. To see this, suppose let us enter the simple data given below.

Letter	A	B	C	D	E	F	G	H
Frequency	2	3	4	5	6	7	8	9

To enter the list editor, we press the LIST button, located below the DEL key, the third button from the left in the second row of buttons from the top. If you have never entered the List editor before then you will see empty lists, an empty spreadsheet. While we can use lists L1, L2, L3, L4, L5, or L6, we can also
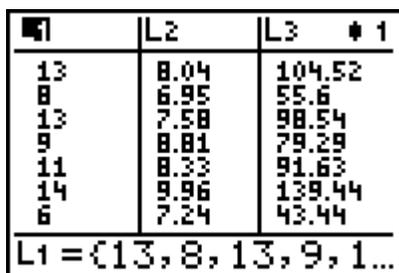
Figure 49: The List Editor displaying lists L1, L2, and L3, each of which contain quantitative data.
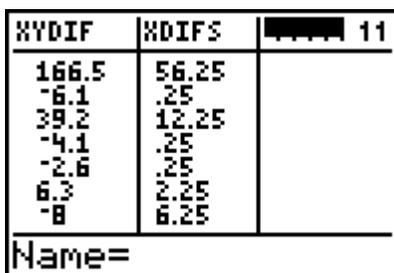
Figure 50: A new list within the List Editor.
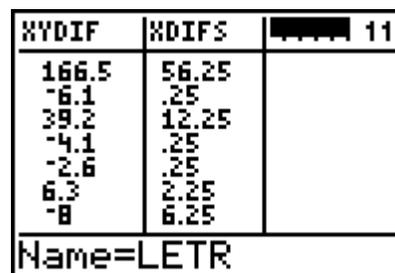
**Figure 51:** Pressing ENTER names the list.

select our own list names. In moving among the lists, if we cannot find an open/empty list then we can remove lists from the spreadsheet by moving the cursor to the top of the list and pressing DEL. This does not delete the list from the calculator but rather removes it from the List Editor display; we can only delete lists using the MEM (memory) menu, accessible using the key sequence 2nd and the zero (0) key.

Here, let us use the name LETR for the letters and FREQ for the frequency. To enter these list names, we use the up arrow to move to the very top row of the list in which the cursor is positioned, and we use the right or left arrow to move into an unnamed list. That, is, if your lists have data that you would like to save as in Figure 49, move to an empty list along the top row using the arrow keys. When working within the list editor, while you can move within the lists along any row, you must be at the top of the list in order to enter a list name, to perform calculations on a list, or to attach a formula to a list. Attaching a formula to a list, makes one list dependent upon the values of the other list; changing values in the independent list causes changes in the values of the dependent list.

The name for a list must start with a letter and the remaining characters can be letters or digits. List names can be between one and five characters in length. As previously discussed, we use the TEXT menu, Figure 48, to enter the letters, and the cursor must be positioned at the top of the list in order to

XYDIF	XDIFS	LETR 11
166.5	56.25	------
-6.1	.25	
39.2	12.25	
-4.1	.25	
-2.6	.25	
6.3	2.25	
-8	6.25	
LETR=		

Figure 52: The new list named LETR.

XYDIF	XDIFS	LETR 11
166.5	56.25	▄▄▄▄▄
-6.1	.25	
39.2	12.25	
-4.1	.25	
-2.6	.25	
6.3	2.25	
-8	6.25	
LETR(1) =		

Figure 53: Ready to enter data in the new list.

| XYDIF	XDIFS	LETR 11
166.5	56.25	▄▄▄▄▄
-6.1	.25	
39.2	12.25	
-4.1	.25	
-2.6	.25	
6.3	2.25	
-8	6.25	
LETR(1) ="A"		

Figure 54: The quotes around the first data value of a categorical list tell the calculator that the data is qualitative.

enter the name of the list. The list must be named before we can enter the data. Once the name for the list has been created then we press ENTER to create the list, Figure 52. Now that we have created the list, we can enter the data. Since the data for the LETR list is categorical, we will enter the first value within quotes; the quotes are accessible from within the TEXT menu. Before we enter the first data value, we must move the cursor off the name-line for the list by either pressing ENTER twice or pressing the down arrow once.

XYDIF	XDIFS	LETR c11
166.5	56.25	A▄▄▄▄
-6.1	.25	
39.2	12.25	
-4.1	.25	
-2.6	.25	
6.3	2.25	
-8	6.25	
LETR(2) =		

Figure 55: A categorical list is indicated by the c in the name bar.

XYDIF	XDIFS	LETR c11
39.2	12.25	C
-4.1	.25	D
-2.6	.25	E
6.3	2.25	F
-8	6.25	G
17.6	30.25	H
-3	6.25	▄▄▄▄▄
LETR(9) =		

Figure 56: The completed categorical list, LETR.

XDIFS	LETR c	FREQ 12
12.25	C	4
.25	D	5
.25	E	6
2.25	F	7
6.25	G	8
30.25	H	9
6.25	------	▄▄▄▄▄
FREQ(9) =		

**Figure 57:** The frequency list, FREQ.

Entering the first data value for our categorical list within quotes, Figure 54, and then pressing ENTER, we see that there is now a c at the top right of the list-name line. This c indicates that this list contains categorical data. The quotes are not displayed around the first data value, Figure 55, once the data has been saved within the categorical list. Now, we enter the rest of the data for the list without using quotes around the values, Figure 56.

We create the quantitative list of data in a similar manner, naming the frequency list, FREQ, in this case, and directly typing the digits to create the needed/desired values. So, to enter the data values into a list, we must type the expression or the digits and then press enter.

LETR c	FREQ	RFREQ 13
A	2	------
B	3	
C	4	
D	5	
E	6	
F	7	
G	8	
RFREQ =		

Figure 58: The relative frequency list, RFREQ.

LETR c	FREQ	RFREQ 13
A	2	------
B	3	
C	4	
D	5	
E	6	
F	7	
G	8	
RFREQ =...FREQ)*100"		

Figure 59: The formula ready to be attached to the relative frequency list, RFREQ.

LETR c	FREQ	RFREQ *13
A	2	4.5455
B	3	6.8182
C	4	9.0909
D	5	11.364
E	6	13.636
F	7	15.909
G	8	18.182
RFREQ(1)=4.5454545...		

Figure 60: The presence of the attached formula is indicated by the asterisk in the name bar.

Once we have created each list, Figure 57, we can create a dependent numerical list, such as the relative frequency, by attaching a formula to a list. After creating our relative frequency list, RFREQ, Figure 58, we can attach the relative frequency list to the frequency list so that if we were to change any of the frequencies corresponding to the data values A, B, C, D, E, F, G, or H then the relative corresponding relative frequencies would be automatically updated just like a MS Excel spreadsheet. Since the relative frequency is the quotient of the frequency and the sum of the frequencies for the data values, either expressed as a decimal or as a percentage, we can attach the formula "LFREQ/sum(LFREQ)*100" to the relative frequency list as in Figure 59. While we can type the list names, it is easier to access them using the STAT menu (press the 2nd button followed by the LIST button), Figure 61. Using the up arrow and the down arrow, we can move among the list names in the list, LS, submenu, and press ENTER to select the desired list name; list names are indicated by the small upper case L at the beginning of a character string. The sum of the frequencies can be obtained using the seventh option, sum(, within the MATH submenu. Examining these submenus as well as the CALC submenu, Figure 63, we can see the various operations and calculations that can be performed with or on lists.

LS OPS MATH CALC
1:L₁
2:L₂
3:L₃
4:L₄
5:L₅
6:L₆
7↓AMNT

Figure 61: The list, LS, submenu.

Ls OPS MATH CALC
1:min(
2:max(
3:mean(
4:median(
5:mode(
6:stdDev(
7:sum(

Figure 62: The MATH submenu.

Ls OPS MATH CALC
1:1-Var Stats
2:2-Var Stats
3:Manual-Fit
4:Med-Med
5:LinReg(ax+b)
6:QuadReg
7:ExpReg

Figure 63: The CALC submenu.

Having created the desired lists, we can now attempt to create a bar graph for our data. Recall the comment at the beginning of this handout that we are limited to seven (7) values for a qualitative variable in regard to creating a bar graph, a pie chart or a pictograph. Our LETR list has eight (8) values. Of

course, needing to learn for ourselves, it is important to check out this limitation. To that end, we press 2nd and the Y= (very top left-hand button in the row of smaller graphing buttons) buttons to open the STAT PLOTS menu, Figure 64. We can use option 4 to turn off all the STAT PLOTS as well as use any of the three listed STAT PLOTS to graph data. Here, we will use Plot1; to access Plot1, we press 1 or move the cursor to the 1 and press ENTER.


Figure 64: The STAT PLOTS menu.

Figure 65: The menu for Plot1.
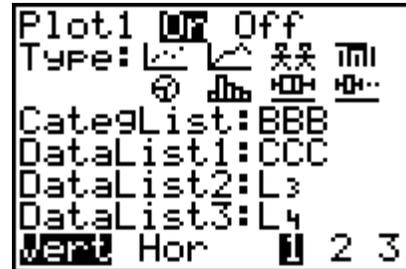
Figure 66: Plot1 is turned on to display a bar graph; the lists must be selected.

In the first row of the Plot1 menu, we move the cursor to On and press ENTER to turn on the plot, we select one of the eight (8) available graph types (moving left to right along the rows: scatter plot, line plot, pictograph, bar graph, pie chart, histogram, box plot, and modified box plot). Here we will select the bar


Figure 67: Plot1 is set up.
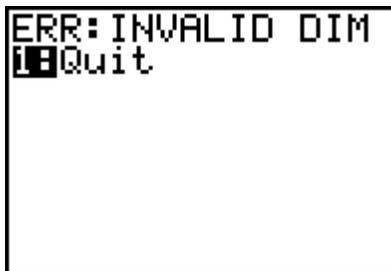
Figure 68: The error message displayed when we attempt to graph the data.

Figure 69: The modified data.

graph. Then, we move to the CategList row to enter the name of the categorical list and then enter the name of the quantitative data list; we can display up to three lists of quantitative data for the given categorical list, either horizontally or vertically. Here, we will attempt to graph only the letters and their corresponding frequencies, Figure 67; nothing else would make sense in regard to the data that we have discussed.
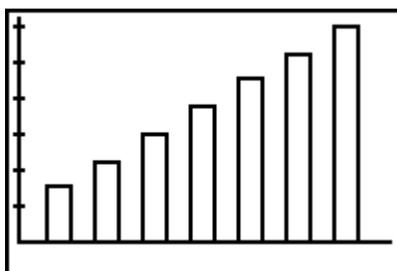
Figure 70: The bar graph.

Figure 71: Setting up Plot1 to display a pictograph.
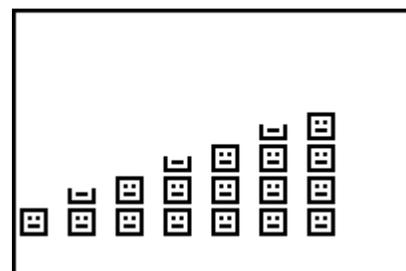
Figure 72: The pictograph with a scale of 2 units per face.

"Believing" that we are ready to graph the data, we press the GRAPH key and obtain the error message displayed in Figure 68 above. Since our categorical data has eight values rather than seven, attempting

to graph this data causes an error. Removing one data value from each list, LETR and FREQ, makes each of our lists of the appropriate and desired size, Figure 69, so that we can graph the data (press the GRAPH button), to view our bar graph, Figure 70. This completed, we can graph a pictograph by selecting the pictograph icon, Figure 71, and select an appropriate whole number scale.


Figure 73: Using the TRACE to obtain information about the data in the graph.
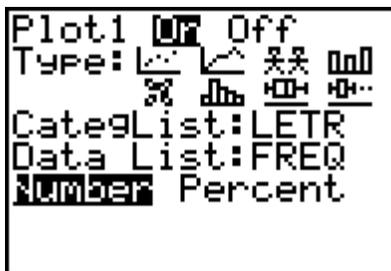
Figure 74: Setting up Plot1 to create a pie chart.
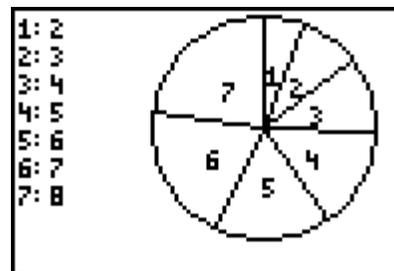
Figure 75: The pie chart for our data.

Using the TRACE as with other graphs, we can move the cursor throughout the graph to understand, to read, and to interpret the data, Figure 73.

Going back to Plot1, we can set up the plot to graph a pie chart. In Figure 74, the plot is set up to graph a pie chart for our frequency data; the pie chart is displayed in Figure 75. Notice that the sections of the pie chart are numbered and the frequency for the data for each section is displayed to the right of the section number.
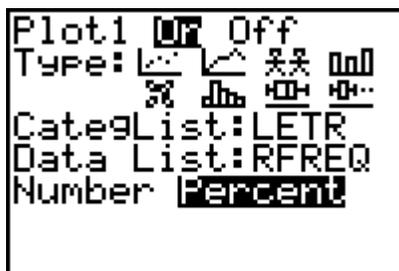
Figure 76: Plot1 set up to display a relative frequency pie chart.
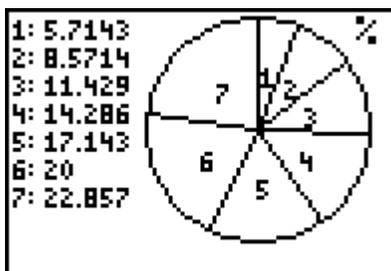
Figure 77: The relative frequency pie chart.

Figure 78: The relative frequencies, list RFREQ.

Changing Plot1 to display the relative frequency pie chart, Figure 76, we see that the relative frequency pie chart is displayed with a percent sign, %, in the top right-hand corner of the graph and that the listed relative frequencies for the sections of the pie chart, Figure 77, correspond to the relative frequencies for the data, Figure 78.

It is important to mention that when we are using the STAT PLOTS, we must turn off the function graphing; any plots or functions that are turned on for graphing will be displayed in the graph window. To determine if any functions are turned on for graphing, we press the Y= button to view the list of functions, if any, present in the function list: if the equal sign for the function equation is highlighted then the function will be graphed in the graph window. In order to turn off the function for graphing, we can either move the cursor to the equal sign and press enter or simply delete the function equation by pressing the CLEAR button on each of the rows corresponding to the functions that we would like to delete.

I hope that this information has been helpful to you in learning about some of the interesting and helpful features of the TI-73 Explorer. Please feel free to contact me, smabrouk@frc.mass.edu, if you have any questions.