



fx-CG50

The status bar will display messages and current status like battery level, angle mode, fraction results, complex mode, or input/output settings.

Select the desired icon by highlighting it and pressing **EXE** or pressing the number or letter in the upper right corner.

The function keys allow you to access the tab (soft key) menus that appear at the bottom of the screen. When an (>) appears above the **F6** key, selecting **F6** will offer more on-screen choices.

The **MENU** key displays every mode the calculator has. To select a mode, press **▶** **▼** to the desired icon and press **EXE** or press the number or letter in the upper right hand corner of the icon.

The **EXIT** key operates like the back arrow on a web browser; it will take you back one screen each time you select it. The **EXIT** key will not take you to the icon menu.

The **SHIFT** key activates any function displayed on or above the calculator buttons that is yellow. For example, to find the square root of a number, you would need to press **SHIFT**, then **x<sup>2</sup>**. **SHIFT** **5** gives you access to on-screen color formatting.

The **AC/ON** key will power the unit on. To turn the unit off, press **SHIFT** **AC/ON**.











The **ALPHA** key activates any function displayed on or above the calculator buttons that is in red. For example, to type the letter A, press **ALPHA**, then **X,θ,T**.

The **EXE** key executes operations. When data is entered, the **EXE** button must be pressed to store the data.

The following explains the meaning of each icon on the fx-CG50 icon menu

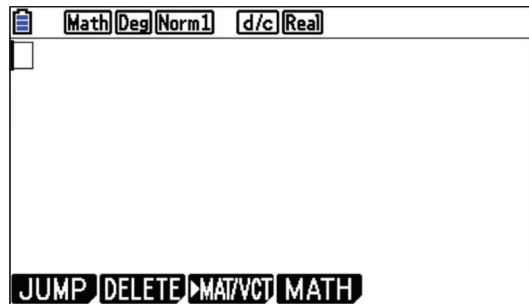
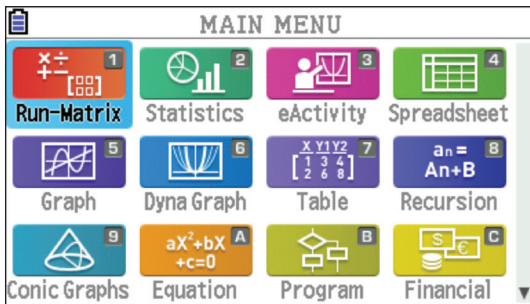
Icon	Menu Name	Description
	<b>RUN-MATRIX</b>	This icon menu is used for general computations, including binary, octal, decimal, and hexadecimal functions and matrices.
	<b>STATISTICS</b>	This icon menu is used to perform single-variable (standard deviation) and paired variable (regression) statistical calculations, to perform tests, to analyze data and to draw statistical graphs.
	<b>eACTIVITY</b>	This icon menu lets you input text, math expressions, and other data in a notebook-like interface. Use this mode when you want to store text, formulas, or built-in application data in a file.
	<b>SPREAD-SHEET</b>	This icon menu is used for creating spreadsheets.
	<b>GRAPH</b>	This icon menu is used to draw, store and calculate information from functions.
	<b>DYNAMIC GRAPH</b>	This icon menu is used to store graph functions and to draw multiple versions of a graph by changing the values assigned to the variables in a function.
	<b>TABLE</b>	This icon menu is used to store functions, to generate a numeric table of different solutions as the values assigned to variables in a function change, and to draw graphs.
	<b>RECURSION</b>	This icon menu is used to store recursion formulas, to generate a numeric table of different solutions as the values assigned to variables in a function change, and to draw graphs.
	<b>CONIC GRAPH</b>	This icon menu is used to graph parabolas, circles, ellipses, and hyperbolas. Conic sections can be inputted as rectangular functions, polar coordinates, or parametric functions for graphing.
	<b>EQUATION</b>	This icon menu is used to solve linear equations with two through six unknowns, and high-order equations from 2nd to 6th degree.

The following explains the meaning of each icon on the fx-CG50 icon menu

Icon	Menu Name	Description
	<b>PROGRAM</b>	This icon menu is used to store programs in the program area and to run programs.
	<b>FINANCIAL</b>	This icon menu is used to perform financial calculations and to draw cash flow and other types of graphs.
	<b>E-CON4</b>	This icon menu is used to control the optionally available EA-200 Data Analyzer. For information about this icon menu, download the E-CON manual from <a href="http://edu.casio.com">http://edu.casio.com</a> .
	<b>LINK</b>	This icon menu is used to transfer memory contents or back-up data to another unit or PC.
	<b>MEMORY</b>	This icon is used to manage data stored in memory.
	<b>SYSTEM</b>	This icon menu is used to initialize memory, adjust contrast, reset memory, and to manage other system settings.
	<b>GEOMETRY</b>	This icon menu allows you to draw, analyze and animate geometric objects.
	<b>PICTURE PLOT</b>	This icon menu allows you to plot points (that represent coordinates) on the screen and then perform various analysis based on the plotted data.
	<b>3D GRAPH</b>	This icon menu allows you to draw 3-dimensional graphs.
	<b>CONVERSION</b>	This icon menu indicates the “Metric Conversion” add-in application is installed. To do conversions, go to the Run-Matrix icon and press <b>OPTN</b> .

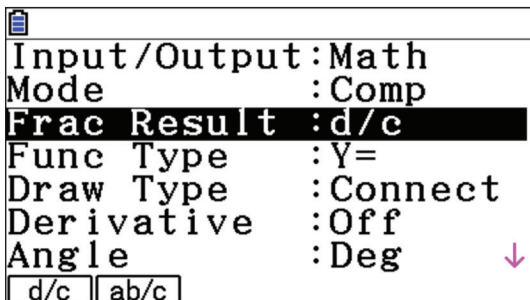
# RUN-MATRIX

For basic calculations, like those that can be done on a scientific calculator, use the Run-Matrix menu. From the Main Menu, press **1**.



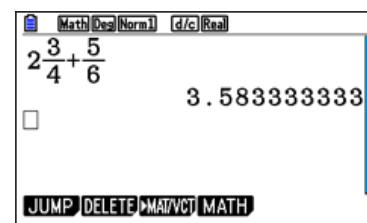
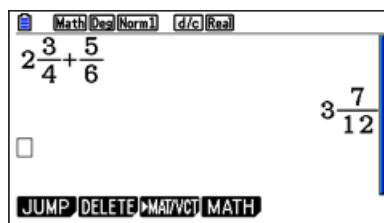
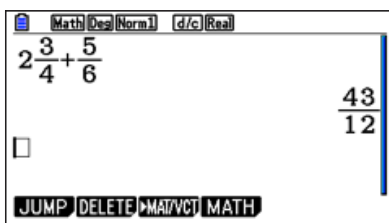
To select how certain commands and results will be interpreted or displayed, press **SHIFT** **MENU** (**SET UP**). For **Input/Output**, select **Math** for natural display of fractions, radicals and other expressions. For **Frac Result**, select **d/c** for a fraction result as the default or **ab/c** for a mixed number as the default. For **Angle**, select **Deg** or **Rad** for degrees or radians.

*Note: the status bar at the top of the screen displays the selection for some of these options.*



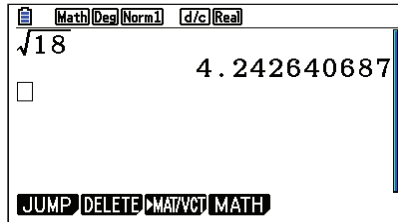
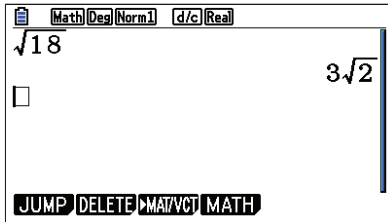
1. Evaluate  $2\frac{3}{4} + \frac{5}{6}$ .

Press **SHIFT** **MENU** (**SET UP**) **2** **▶** **3** **▶** **4** **▶** **+** **MENU** **5** **▶** **6** **EXE**. To see the result as a mixed number, press **SHIFT** **S+D** ( $a\frac{b}{c} + \frac{d}{e}$ ). To see the result as a decimal, press **S+D**.



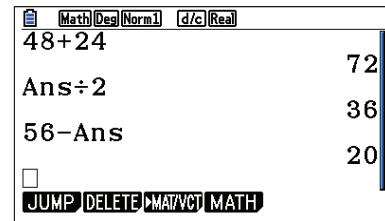
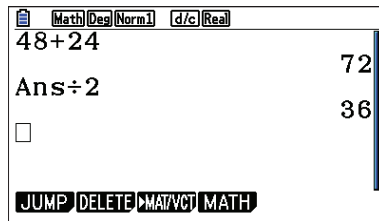
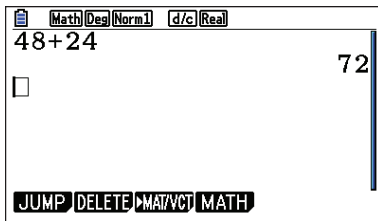
2. Simplify  $\sqrt{18}$ .

Press **SHIFT**  **$x^2$  ( $\sqrt{\quad}$ )** **1** **8** **EXE**. To see the result as a decimal, press **S+D**.



3. Add 48 and 24. Then, divide by 2. Finally, subtract from 56.

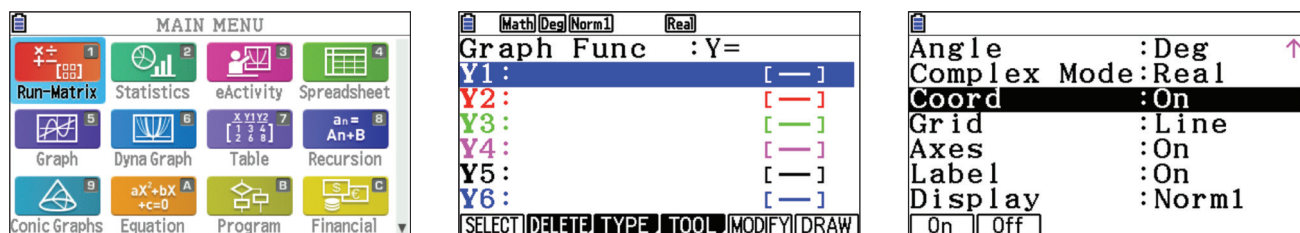
The purpose of this example is to demonstrate the **Ans** key. **Ans** represents the previous answer. Press **4** **8** **+** **2** **4** **EXE**. Then, press  **$\div$**  **2** **EXE**. **Ans** appears automatically when an operation symbol is pressed. However, **Ans** has to be pressed for the subtraction part. Press **5** **6** **-** **SHIFT** **( $\leftarrow$ )** **(Ans)** **EXE**.



# GRAPH

To construct graphs and use graphical analysis commands, use the Graph menu. From the Main Menu, press **[5]**.

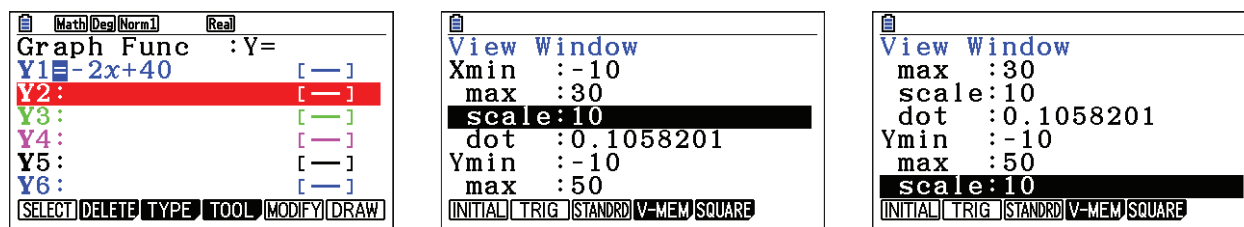
The first screen is the function/relation editor. To select how certain results will be displayed, press **[SHIFT]** **[MENU]** (**SET UP**). The suggested selections for **Coord**, **Grid**, **Axes** and **Label** are shown. Scroll down to these selections. To make a change, highlight the item and use the function button that appears directly below the desired tab. For example, when **Coord** is highlighted, **[F1]** (On) will turn coordinates on and **[F2]** (Off) will turn coordinates off. Press **[EXIT]** to return to the editor.



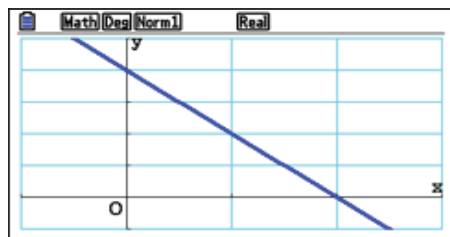
The Math Club plans to sell t-shirts. Previous experience suggests that the number of t-shirts sold depends on the price. A good model for the number sold,  $y$ , as a function of the price,  $x$ , is  $y = -2x + 40$ .

1. Construct a graph of this equation.

To construct a graph of this model, press **[←]** **[2]** **[X,θ,T]** **[+]** **[4]** **[0]** **[EXE]**. To select the view window, press **[SHIFT]** **[F3]** (**V-Window**). Change the values for the window, as shown, pressing **[EXE]** after each value. The values for **Scale** determines the location for the marks on the axes and the gridlines. Press **[EXIT]** to return to the editor.

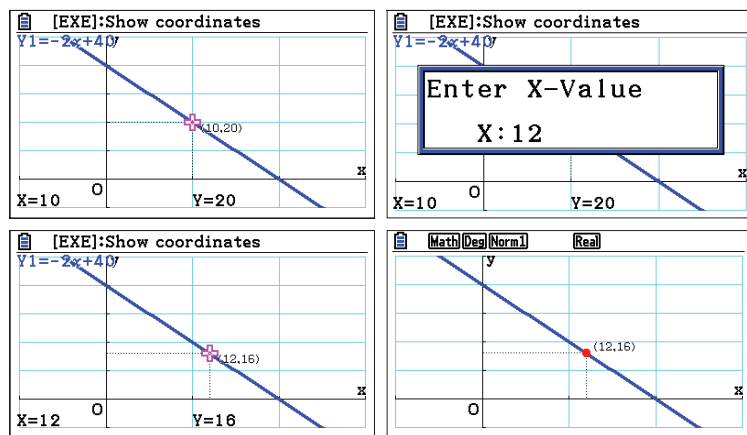


To draw the graph, press **[F6]** (**DRAW**). When a graph is displayed the **[+]** key can be used to zoom in, the **[−]** key to zoom out, and **[▶]** **[◀]** **[▲]** **[▼]** to scroll.



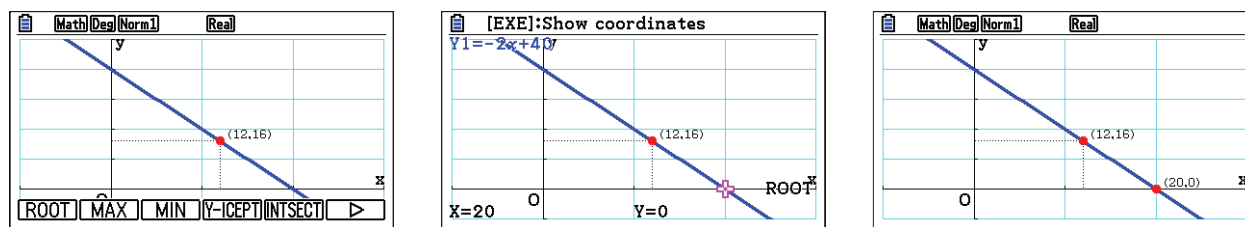
2. How many shirts would be sold at a price of \$12 per t-shirt?

To trace on the graph, press **SHIFT** **F1** (**Trace**). Use **▶** **◀** to move the cursor. To select a specific value, type the value, in this case **1** **2**. A dialogue box opens, press **EXE**. To mark a point and keep the coordinates on the display, press **EXE** a second time.



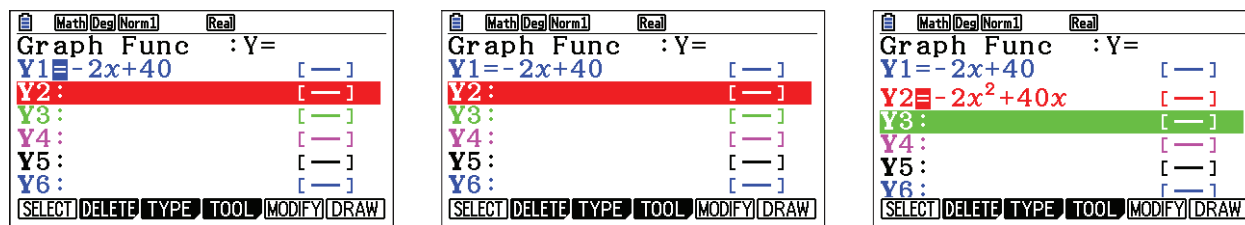
3. There is a price that is too high, meaning no shirts are sold. This point occurs at the x-intercept of the graph (where  $y = 0$ ) and the value of  $x$  is a root of the equation  $-2x + 40 = 0$ .

To find the root, press **SHIFT** **F5** (**G-Solv**) **F1** (**ROOT**). The result, \$20, is shown at the bottom of the screen. To mark this intercept and keep the coordinates on the display, press **EXE** a second time.



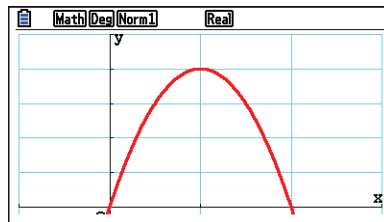
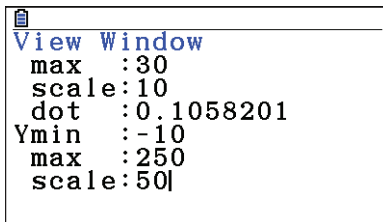
4. If  $-2x + 40$  shirts are sold at price,  $x$ , then the number of dollars collected for the sale is  $x(-2x + 40)$  or  $-2x^2 + 40x$ .

To graph this function, first, deselect the previous equation by pressing **EXIT**, **▲** so the cursor is on **Y1**, then press **F1** (**SELECT**) **▼**. Note, the = sign is not highlighted. The cursor should now be on **Y2**. Press **(←)** **2** **X,θ,T** **x<sup>2</sup>** **+** **4** **0** **X,θ,T** **EXE**.



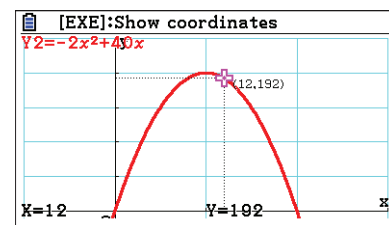
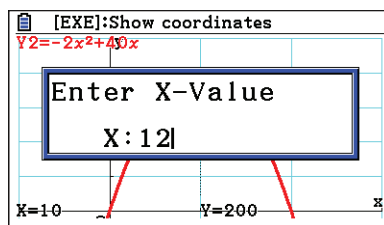
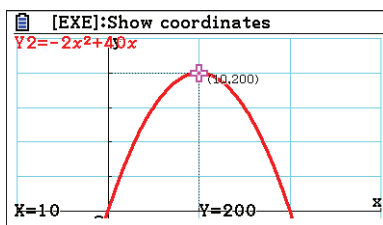
# GRAPH

To set up the view window, press **SHIFT** **F3** (**V-Window**). Change the values for the window so that **Ymax** is 250 and **Yscale** is 50. Press **EXIT** to return to the editor. To draw the graph, press **F6** (**DRAW**).



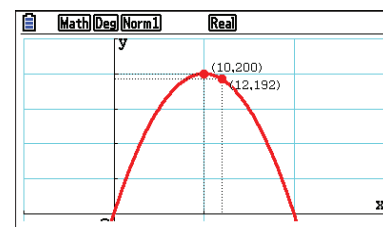
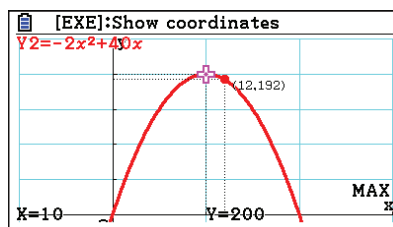
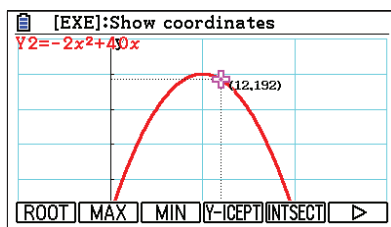
5. Compute the number of dollars earned, if each t-shirt is sold at \$12.

To compute the number of dollars earned if shirts are sold for \$12, press **SHIFT** **F1** (**Trace**). Type the value, in this case **1** **2**. A dialogue box opens, press **EXE**. The models predict that at a price of \$12, 16 shirts will be sold for a total of \$192.



6. Determine the price that will give the greatest profit.

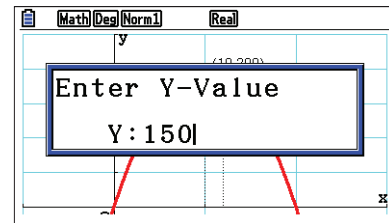
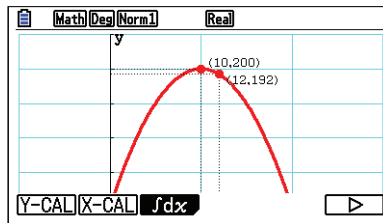
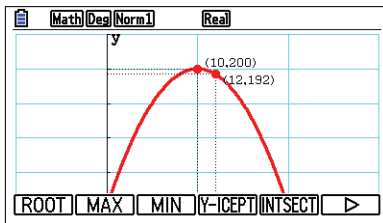
To determine the price that is predicted to make the most money, press **SHIFT** **F5** (**G-Solv**) **F2** (**MAX**). The results, \$10 and \$200, are shown at the bottom of the screen. To mark the point and keep the coordinates on the display, press **EXE**.



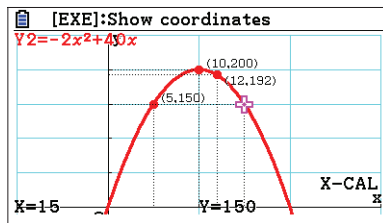
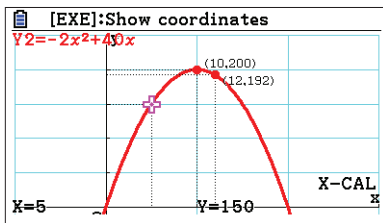


7. Determine the price of each t-shirt in order to collect \$150.

To determine the price of each t-shirt, in order to collect a total of \$150, press **SHIFT** **F5** (**G-Solv**) **F6** (**▷**) **F2** (**X-CAL**) **1** **5** **0** **EXE**. (The **▷**) symbol moves to the next page of commands.)

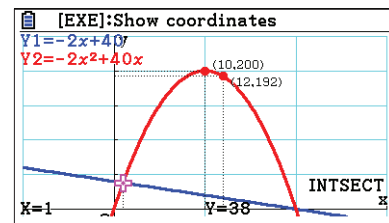
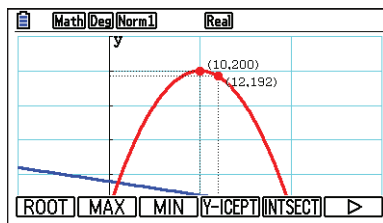
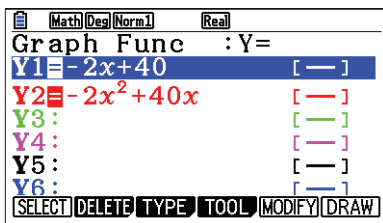


There is another point where  $y = 150$ . Use **▷** to move to the next point. Press **EXE** to mark one or both of these points. \$150 can be earned by selling shirts at \$5 or at \$15.



8. Find the intersection of the equations in **Y1** and **Y2**.

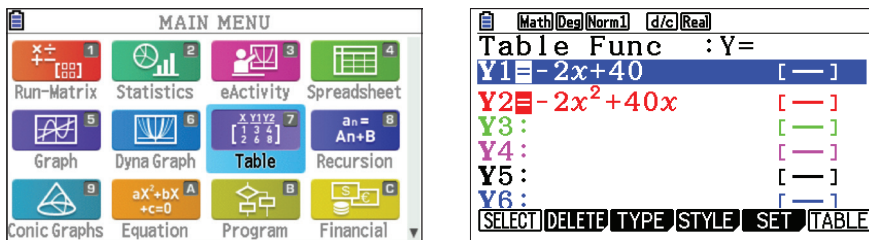
Although it is not particularly meaningful in this example, a common problem is to find the intersection point of two graphs. Press **EXIT** to return to the editor. Highlight **Y1** and press **F1** (**SELECT**). Now, both graphs will be drawn. Press **F6** (**DRAW**). To find the intersection points for the two graphs, press **F5** (**G-Solv**) **F5** (**INTSECT**). 38 shirts are sold at the price of \$1, for a total of \$38. (These graphs also intersect at (20, 0) where no shirts were sold.)



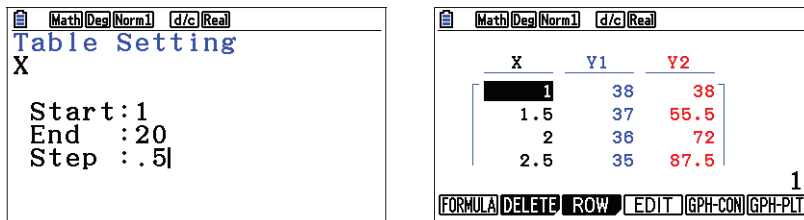
# TABLE

1. Construct a table of values that shows the price, number of shirts, and total dollars using increments of \$0.50.

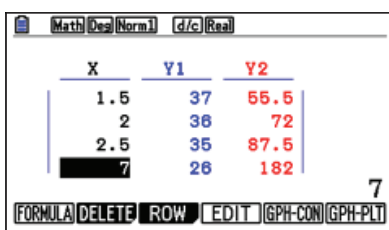
To construct tables, from the Main Menu, press **[7]**. The equations for the functions appear if they have been previously entered, including those entered in the Graph menu.



To set the initial value, end value and the increment, press **[F5]** (SET). Enter the values for **Start**, **End** and **Step**. Press **[EXE]** after entering each value, then press **[EXIT]**. To display the table, press **[F6]** (TABLE). Use **[▼]** to scroll through the table.



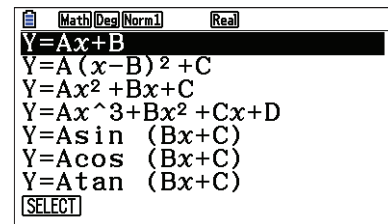
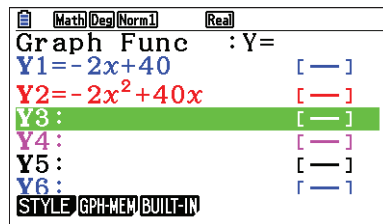
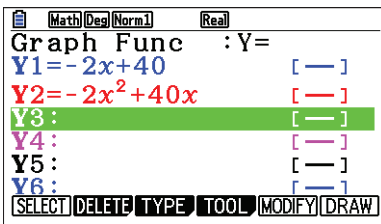
*Note: values in the x-column can also be changed manually. Press any value desired, then press **[EXE]**. Here, the value of 3 was changed to 7.*



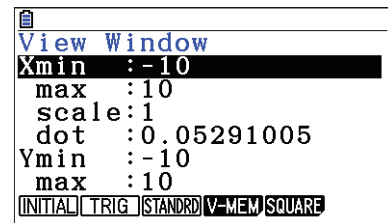
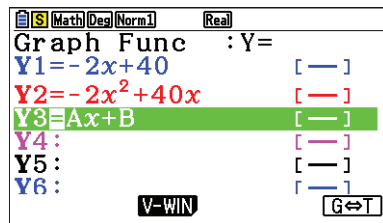
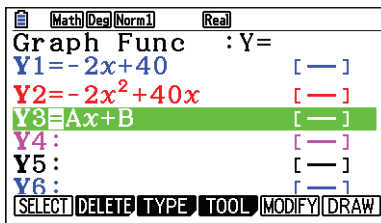
# GRAPH-MODIFY

1. Explore how the graph of the function  $y = Ax + B$  changes for different values of A and B.

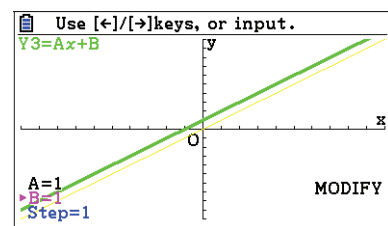
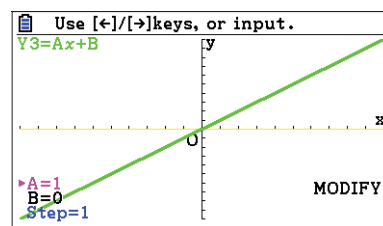
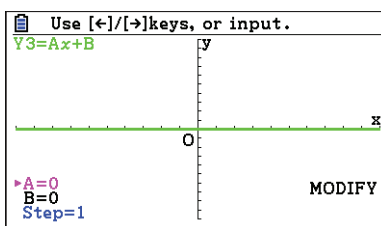
From the Main Menu, press **[5]**. Use **[F1]** (SELECT) to deselect any functions and **[v]** to move to a new line; in this screen shot, it is **Y3**. Press **[F4]** (TOOL) **[F3]** (BUILT-IN). With **Y=Ax+B**, highlighted, press **[F1]** (SELECT).



To use a standard window, press **[SHIFT]** **[F3]** (V-Window) **[F3]** (STANDRD) **[EXIT]**.



Press **[F5]** (MODIFY). A graph is drawn based on values stored to **A** and **B**. Values for the variables are displayed in the lower left portion of the screen. The active value is magenta, in this case, **A**. Press **[▶]** to increase **A** by the value shown as **Step**. Press **[◀]** to decrease **A**. Alternately, press any number keys to change the value of **A**. A dialogue box opens displaying the new desired value, then, press **[EXE]**. Notice, the previous graph is drawn in faint yellow. Use **[v]** **[u]** to change the value of a different variable or the value for **Step**.

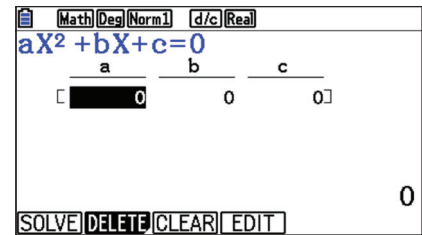
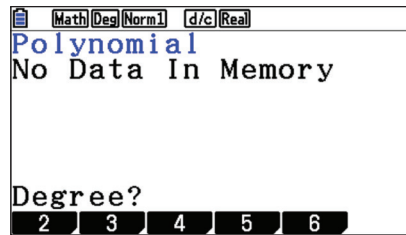
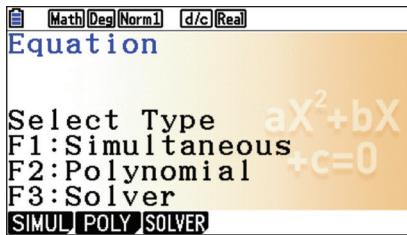


# EQUATION

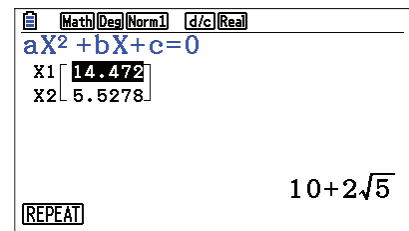
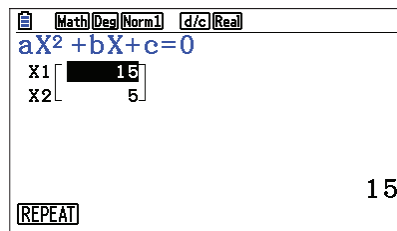
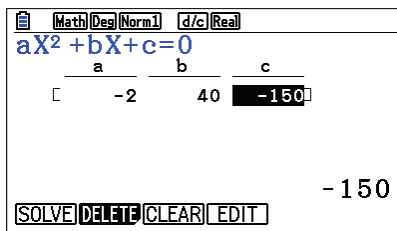
1. The equation  $-2x^2 + 40x = 150$  was previously solved in the Graph menu. It can also be solved in the Equation menu by transforming it to  $-2x^2 + 40x - 150 = 0$ .

Press **MENU** **X,0,T** (A). (It is not necessary to push **ALPHA**.) To solve polynomial equations, press **F2** (POLY).

Press **F1** (2) for a second degree polynomial.



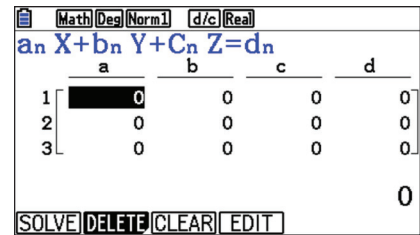
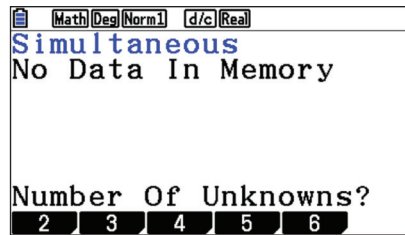
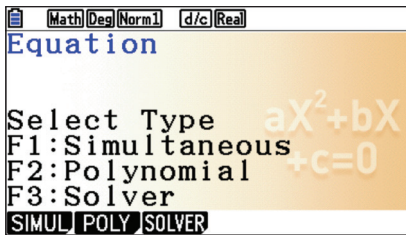
Enter the 3 coefficients, pressing **EXE** after each one. Note, equations must be in standard form to solve. To solve, press **F1** (SOLVE). Both solutions are displayed. Note, when solutions are not rational, both a decimal and an exact solution are displayed. The third screenshot displays the solutions to  $-2x^2 + 40x - 160 = 0$ .



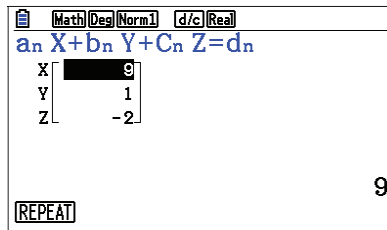
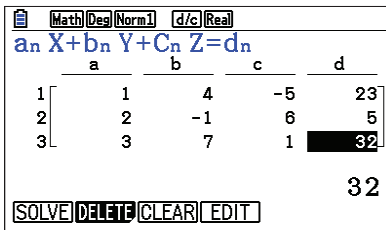
# EQUATION

2. Solve the system 
$$\begin{cases} a + 4b - 5c = 23 \\ 2a - b + 6c = 5 \\ 3a + 7b + c = 32 \end{cases}$$

The Equation menu can also be used to solve linear systems. Within the Equation menu, press **SHIFT** **EXIT** (**QUIT**). Press **F1** (**SIMUL**), then **F2** (**3**).



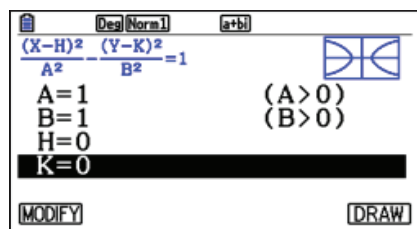
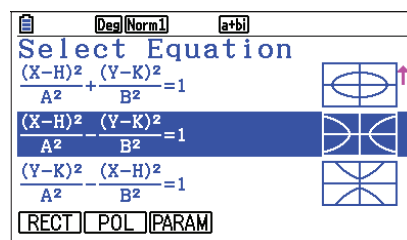
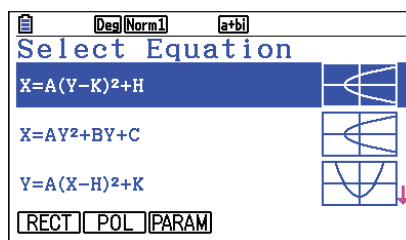
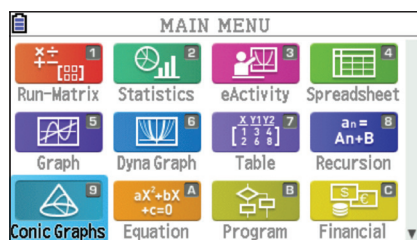
Enter all 12 values, pressing **EXE** after each one. To solve this system, press **F1** (**SOLVE**).



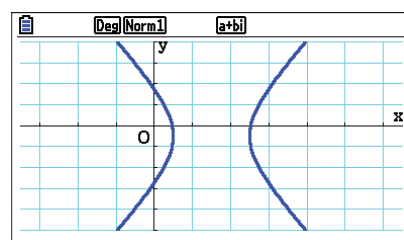
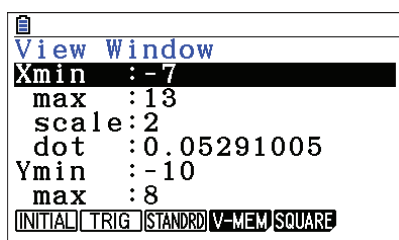
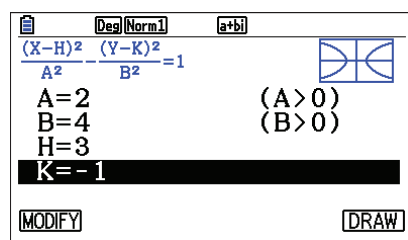
# CONICS

1. Construct the graph of the conic section  $\frac{(x-3)^2}{4} - \frac{(y+1)^2}{16} = 1$ .

From the Main Menu, press **9**. Scroll down to the correct form and press **EXE**.

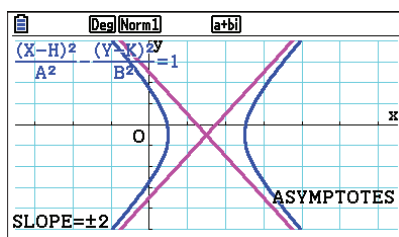
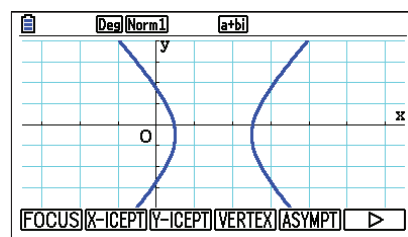


Enter the correct values. Note, the exponents in the denominators, so  $A = 2$ , rather than 4. Also, note the minus signs in the numerator, so  $H = 3$  and  $K = -1$ . Press **EXE** after each value. As before, press **SHIFT F3 (V-Window)** to change the values for the window, then press **EXIT**. To draw the graph, press **F6 (DRAW)**.



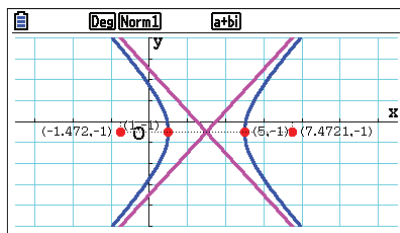
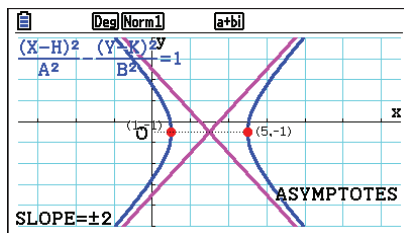
2. Find the asymptotes for the conic graph.

To draw the asymptotes, press **SHIFT F5 (G-Solv) F5 (ASYMPT)**. The slope for each line is also displayed.



3. Find and label the vertices and foci for the conic graph.

To find the coordinates of the vertices, press **SHIFT** **F5** (**G-Solv**) **F4** (VERTEX). To find the coordinates of the foci, press **SHIFT** **F5** (**G-Solv**) **F1** (FOCUS). In each case, press **▶** to move to the second point. To mark points and label the coordinates on the display, press **EXE**.

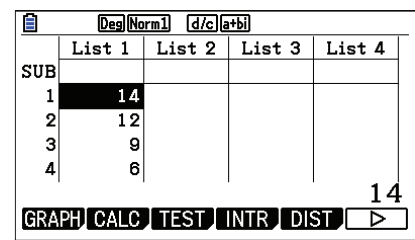
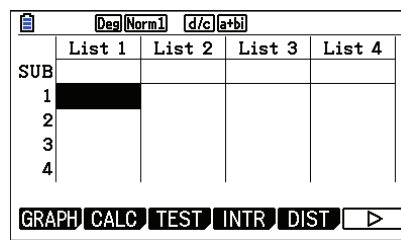
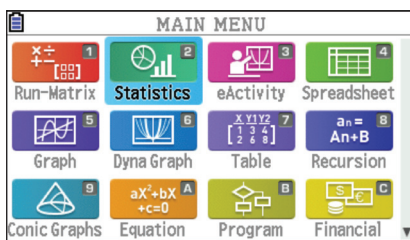


# STATISTICS

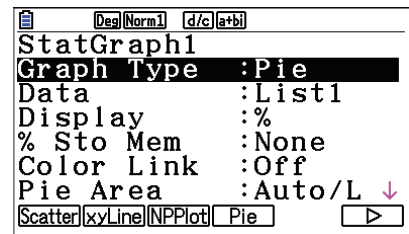
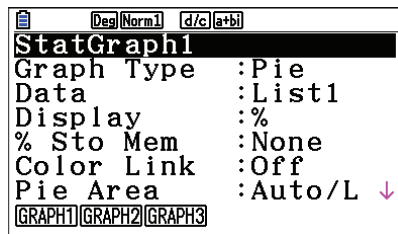
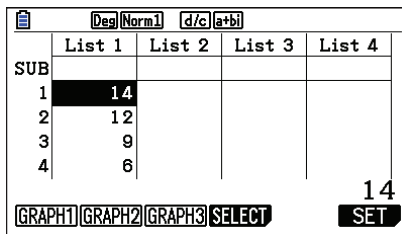
1. Suppose one of the questions asked on a survey was “What type of pet do you have?”, and the results from 50 people are shown in this table. Construct a pie chart and a bar chart of these data.

Pet Category	Dog	Cat	Fish	Bird	Other	None
Frequency	14	12	9	6	4	5

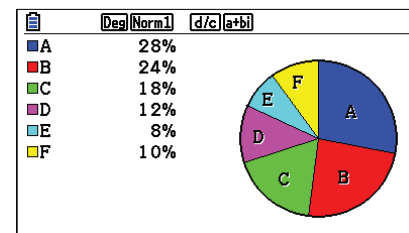
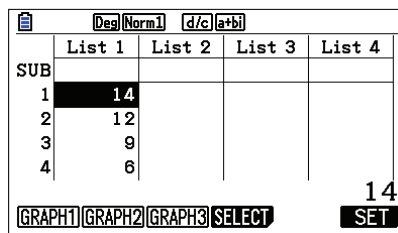
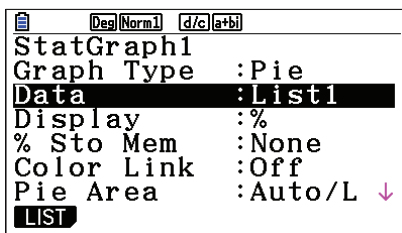
From the Main Menu, press **[2]**. The list editor opens. Enter the values in the table in **List 1**, pressing **[EXE]** after each value.



To construct a graph, press **[F1]** (GRAPH). Then, press **[F6]** (SET). Scroll to **Graph Type** and select **[F4]** (Pie).



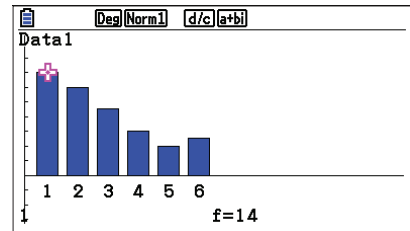
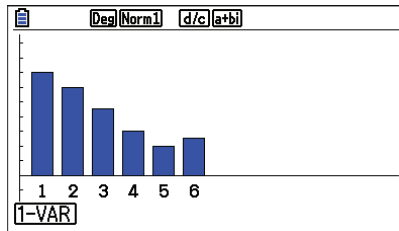
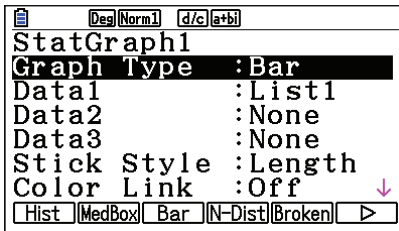
If necessary, scroll to **Data** and change to **List1**. **Display** can be used to select percentages or counts with the chart. Press **[EXIT]** and **[F1]** (GRAPH1). The color and shading of plots can be changed by using **[SHIFT]** **[5]** (**FORMAT**).





# STATISTICS

To change to a bar chart, press **EXIT** **F6** (SET) **F6** ( $\triangleright$ ) **F3** (Bar). Press **EXIT** **F1** (GRAPH1) to view the bar chart. To display the frequencies, press **SHIFT** **F1** (Trace).



2. The number of games won (out of 162) by a certain baseball team for the years 2002 – 2013 are shown in the table. Construct a histogram and a boxplot for these data.

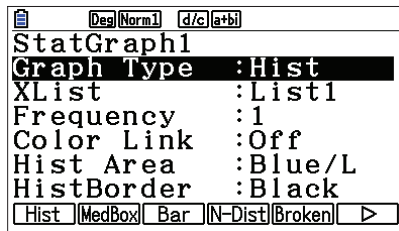
67	88	89	79	66	85
97	83	75	71	61	66

Enter these data in the list editor. To set **StatGraph1** to a histogram, press **F1** (GRAPH) and **F6** (SET). For **Graph Type**, select **F1** (Hist).

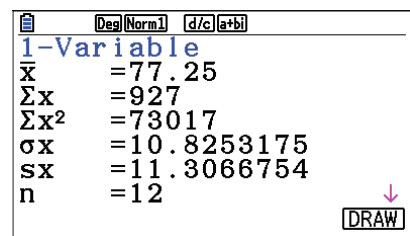
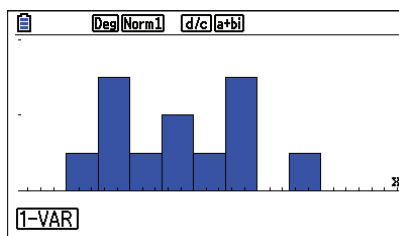
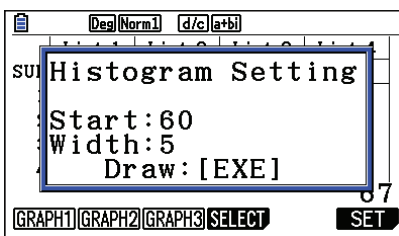
SUB	List 1	List 2	List 3	List 4
1	67			
2	88			
3	89			
4	79			

67

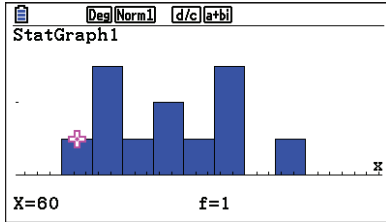
[GRAPH] [CALC] [TEST] [INTR] [DIST] [ ]



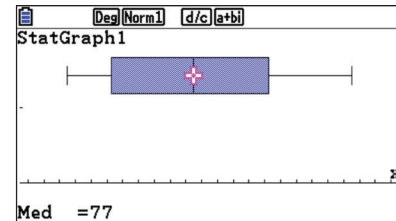
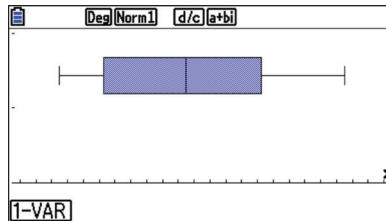
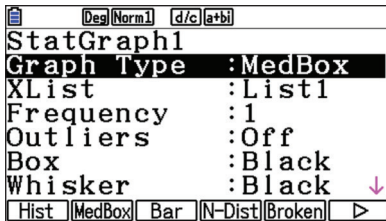
Press **EXIT** **F1** (GRAPH1). Select **Start** and **Width** values to determine the rectangles that will be plotted. Press **F1** (1-VAR) to see the statistical analysis of the data.



Press **F6** (DRAW) to return to the plot. To display the frequencies, press **SHIFT F1** (Trace).



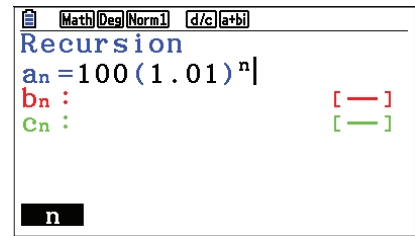
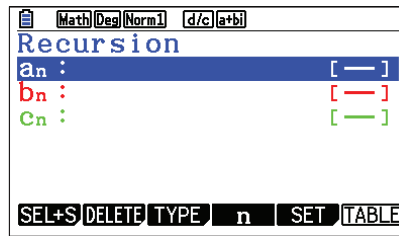
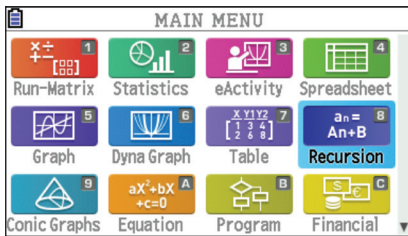
To change to a box-and-whisker plot (boxplot or median box plot), press **EXIT F6** (SET). Scroll to **Graph Type** and press **F2** (MedBox). Press **EXIT F1** (GRAPH1). To display the minimum, maximum, and quartiles, press **SHIFT F1** (Trace). Use **▶** to display the next value.



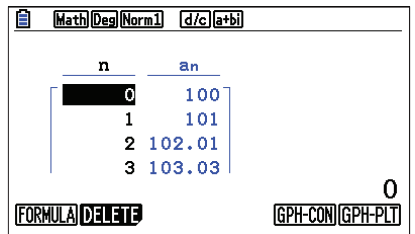
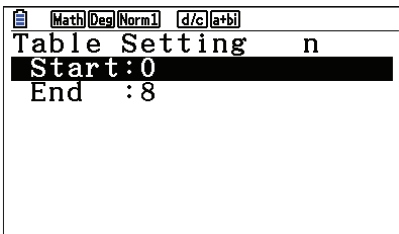
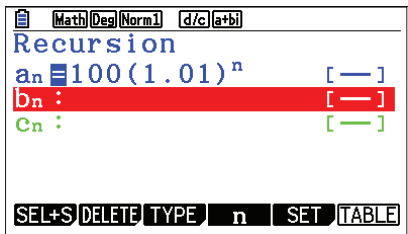
# RECURSION

1. Suppose \$100.00 is deposited into a savings account with an interest rate of 4% compounded quarterly. How much is in the account for each of the first 8 quarters?

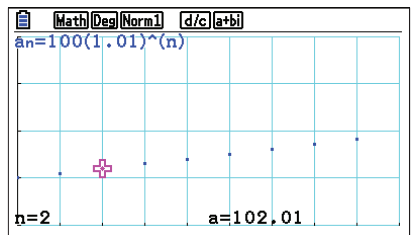
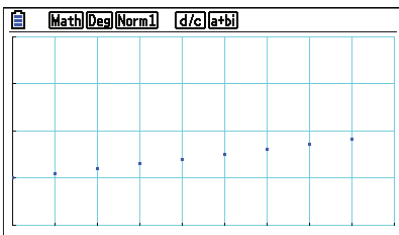
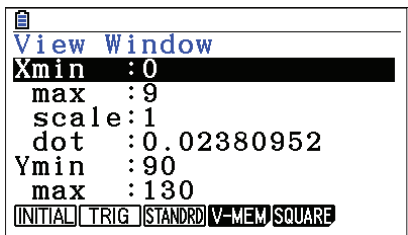
Because this is a discrete model, it can be modeled as a sequence. Although the menu says Recursion, it can be used for both explicit and recursive sequences. From the Main Menu, press **[8]** to open the sequence editor. If the type is not **a<sub>n</sub>**, press **[F3]** (TYPE) **[F1]** (**a<sub>n</sub>**). The account pays 1% per quarter so enter the formula as shown, using **[F1]** (**n**) for **n**. Press **[EXE]**.



To create a table of values, press **[F5]** (SET). Select **Start** and **End** values and press **[EXE]** after entering each value. To display the table, press **[EXIT]** **[F6]** (TABLE).



This sequence can also be viewed as a graph. Before plotting the graph, set a window by pressing **[SHIFT]** **[F3]** (**V-Window**). Press **[EXIT]**. To see the graph, press **[F6]** (GPH-PLT). To trace on the graph, press **[SHIFT]** **[F1]** (**Trace**).



# RECURSION

The sequence can also be created as a recursive formula. Return to the editor using **SHIFT** **EXIT** (**QUIT**). To change the type, press **F3** (**TYPE**) **F2** (**a<sub>n+1</sub>**) and edit the equation. To insert **a<sub>n</sub>**, press **F2** (**a<sub>n</sub>**) then **EXE**. To specify the initial value, press **F5** (**SET**). For **a<sub>0</sub>**, enter **1 0 0 EXE**.

Math Deg Norm1 d/c |a+b|

Select Type

F1 :  $a_n = A_n + B$   
 F2 :  $a_{n+1} = A a_n + B n + C$   
 F3 :  $a_{n+2} = A a_{n+1} + B a_n + \dots$

an an+1 an+2

Math Deg Norm1 d/c |a+b|

Recursion

$a_{n+1} = 1.01 a_n$  [—]  
 $D_{n+1} :$  [—]  
 $C_{n+1} :$  [—]

SEL+S DELETE TYPE n.an... SET TABLE

Math Deg Norm1 d/c |a+b|

Table Setting n+1

Start: 0  
 End : 8  
 $a_0 : 100$   
 $b_0 : 0$   
 $c_0 : 0$   
 $a_n$  Str: 0

ao a1

To see the table, press **EXIT** **F6** (**TABLE**). To view a graph, press **F6** (**GPH-PLT**).

Math Deg Norm1 d/c |a+b|

n	$a_n$
0	100
1	101
2	102.01
3	103.03

FORMULA DELETE GPH-CON GPH-PLT

Math Deg Norm1 d/c |a+b|

$a_{n+1} = 1.01 a_n$

n=8 a=108,2856706

2. How long will it take for the account to double in value to \$200.00?

One good way to answer this question is to return to the Equation menu. Press **MENU** **X,θ,T** (**A**). To enter the equation, press **F3** (**SOLVER**). If **F3** (**SOLVER**) is not an option, press **EXIT** until it is. To insert the =, press **SHIFT** **=** (**=**). Once the equation is entered, press **EXE** or **F6** (**SOLVE**). It will take 70 quarters or  $17\frac{1}{2}$  years for the investment to double.

Math Deg Norm1 d/c |a+b|

Eq :

RECALL DELETE SOLVE

Math Deg Norm1 d/c |a+b|

Eq :  $100(1.01)^x = 200$   
 $x=0$   
 Lower =  $-9E+99$   
 Upper =  $9E+99$

RECALL DELETE SOLVE

Math Deg Norm1 d/c |a+b|

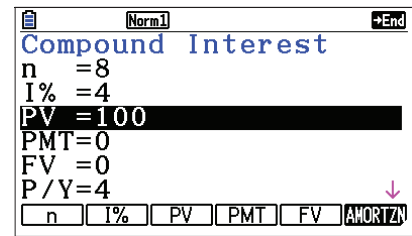
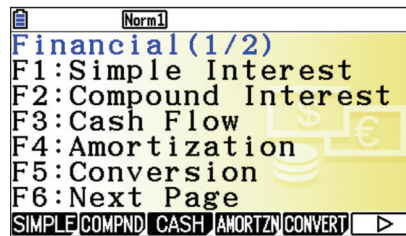
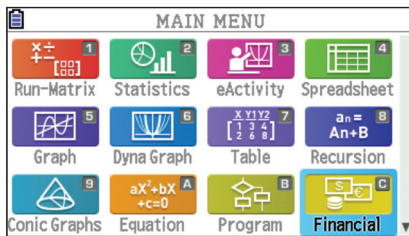
Eq :  $100(1.01)^x = 200$   
 $x=69.66071689$   
 Lft = 200  
 Rgt = 200

REPEAT

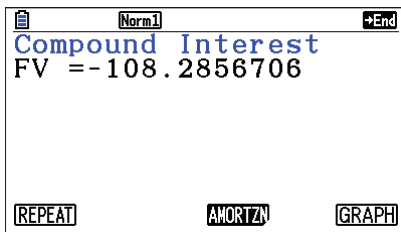
Financial analysis can be done from the Finance menu (**In**).

1. Compute the amount in the account (from our previous example) after 8 quarters.

To compute the amount in the account after 8 quarters, use compound interest. For compound interest, press **F2** (COMPND). Enter the values, as shown, for **n**, **I%**, **PV**, and **P/Y**. **PV** is the present value, the initial amount. **P/Y** is the number of payments per year. Remember to press **EXE** after entering each value.

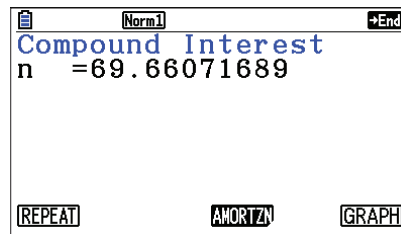
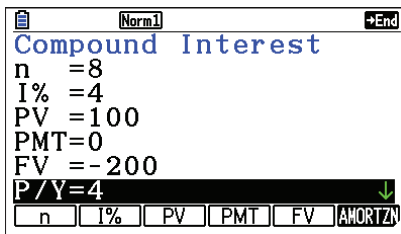


To compute the future value, press **F5** (FV). The negative sign is correct, as a reasonable interpretation is that \$100 was deposited and \$108.28 can be withdrawn. This value agrees with the previous result from the Recursion menu.



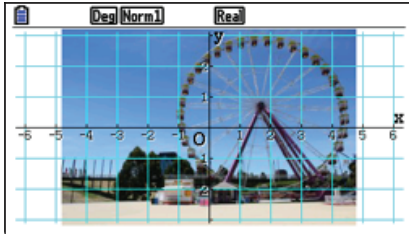
2. Determine how long it will take for the account to double in value to \$200.00.

To determine how long it will take for the account to double in value to \$200.00, press **F1** (REPEAT). For **FV**, enter **(-) 2 0 0 EXE**, then press **F1** (n). This value agrees with the previous result from the Equation menu.

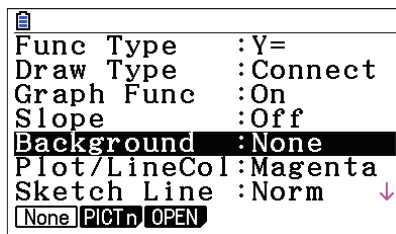
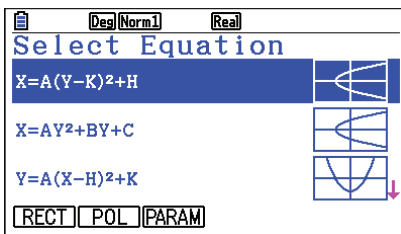


## CONIC GRAPHS IMAGE BACKGROUND

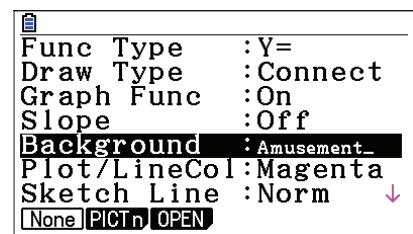
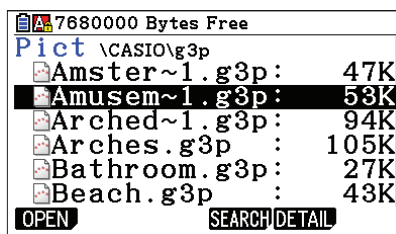
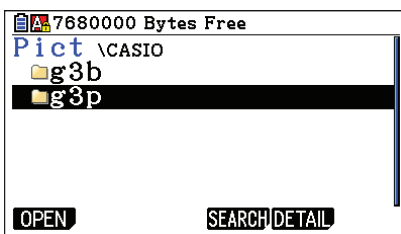
1. What is an equation for a circle in the image?



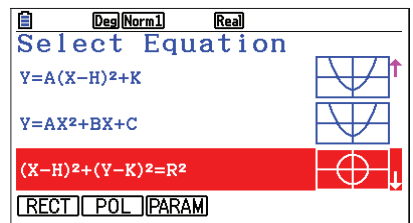
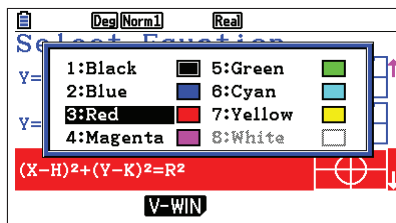
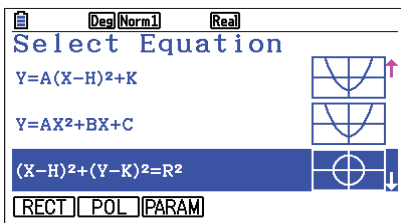
From the Main Menu, press **[9]**. To select a background, press **[SHIFT]** **[MENU]** (**SET UP**). Scroll to **Background** and press **[F3]** (**OPEN**). Highlight the **CASIO** folder and press **[F1]** (**OPEN**).



Scroll down to the **g3p** folder and press **[F1]** (**OPEN**). Scroll down to **Amusem~1.g3p** and press **[F1]** (**OPEN**).



Press **[EXIT]**. Scroll down to the equation for the circle and press **[EXE]**. To change the color, press **[SHIFT]** **[5]** (**FORMAT**) **[3]** (Red).



# CONIC GRAPHS

Press **F1** (MODIFY). Modify the coefficients to find a good model.

**Deg** **Norm1** **Real**

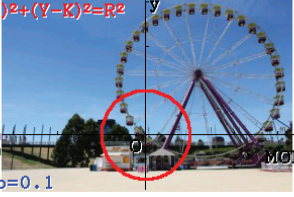
$(X-H)^2+(Y-K)^2=R^2$

**H=0**  
**K=0**  
**R=1**      **(R > 0)**

**MODIFY**      **DRAW**

Use **[←]/[→]** keys, or input.

$(X-H)^2+(Y-K)^2=R^2$

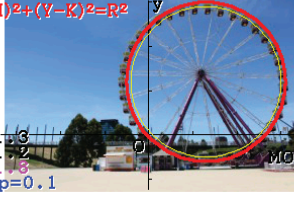


**H=0**  
**K=0**  
**R=1**  
**Step=0.1**

**MODIFY**

Use **[←]/[→]** keys, or input.

$(X-H)^2+(Y-K)^2=R^2$



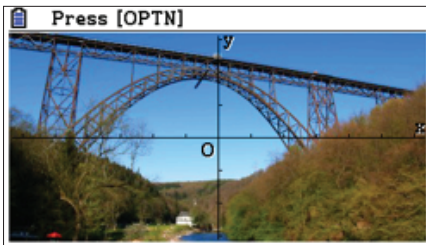
**H=1.16**  
**K=1.72**  
**R=1.46**  
**Step=0.1**

**MODIFY**

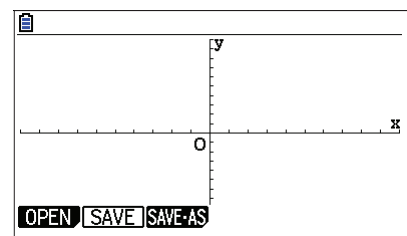
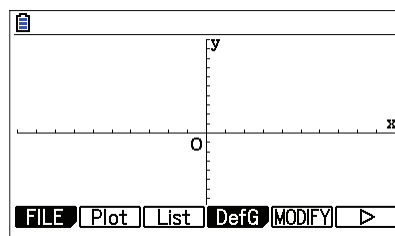
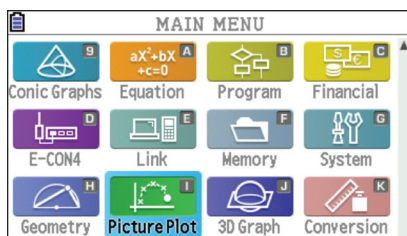
# PICTURE PLOT

As an alternate to Modify, the PRIZM™ fx-CG50 allows you to plot points on a image and use regression to find a model.

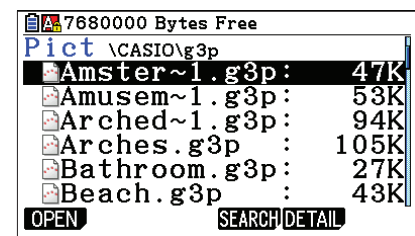
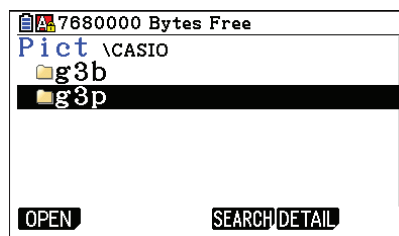
1. What is an equation for a line in the image?



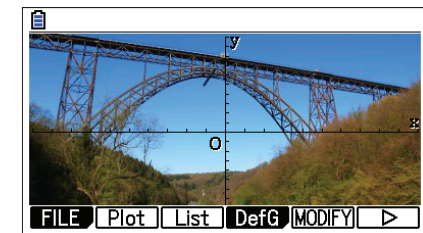
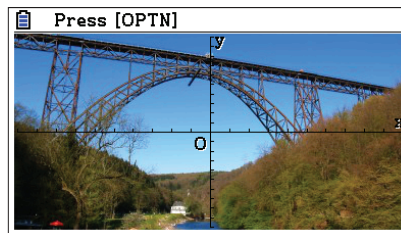
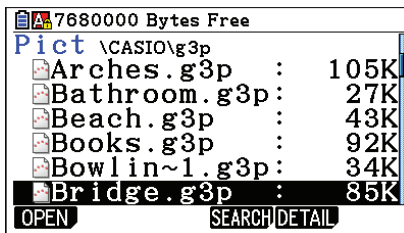
From the Main Menu, press  $\square$  (I). To open the image, press  $\square$  (OPTN)  $\square$  (F1) (FILE)  $\square$  (F1) (OPEN).



Highlight the CASIO folder and press  $\square$  (F1) (OPEN). Scroll down to the **g3p** folder and press  $\square$  (F1) (OPEN).



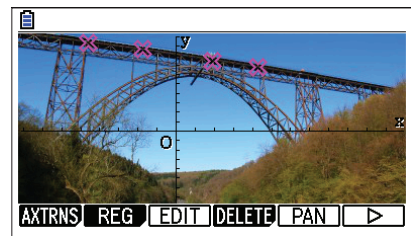
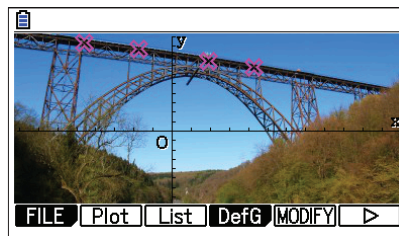
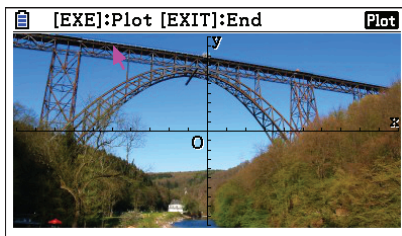
Scroll down to **Bridge.g3p** and press  $\square$  (F1) (OPEN). To plot points, press  $\square$  (OPTN)  $\square$  (F2) (Plot).



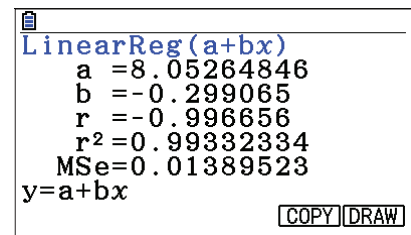
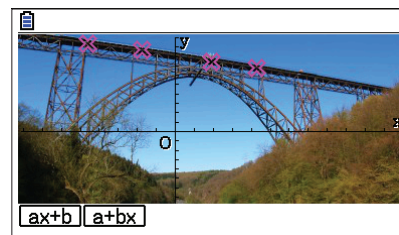
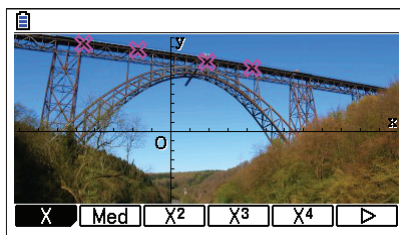


# PICTURE PLOT

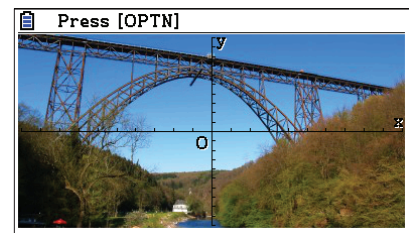
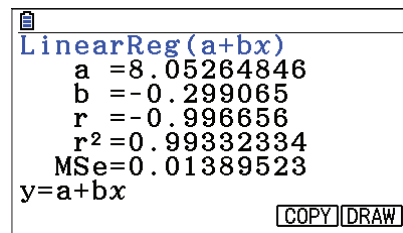
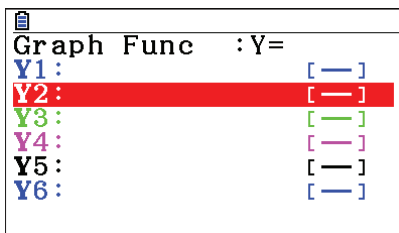
Use the direction wheel to move the arrow to a point on the line. Press **[EXE]** to mark the point. Continue to mark several additional points. When done, press **[EXIT]**. To perform a regression, press **[F6]** (**[▷]**) **[F2]** (REG).



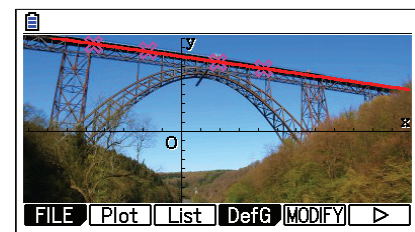
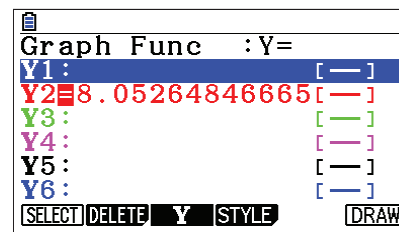
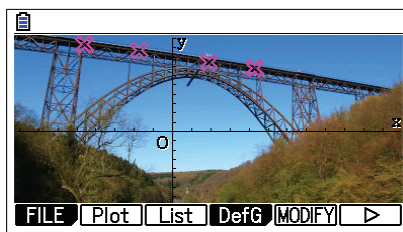
For linear regression, press **[F1]** (X) and select either form. Here, **[F2]** (a+bx) is used.



To save the result, press **[F5]** (COPY). The display is improved if the graph is not blue, so scroll to **Y2** and press **[EXE]**. Press (DRAW) to view the equation of the line. The graph is drawn but as a thin blue line.

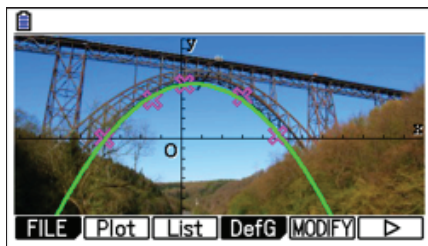


To draw the graph that was saved, press **[OPTN]** **[F4]** (DefG) **[F6]** (DRAW).



# PICTURE PLOT

In a similar manner, a quadratic model can be used for another portion of the bridge.



# NOTES

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