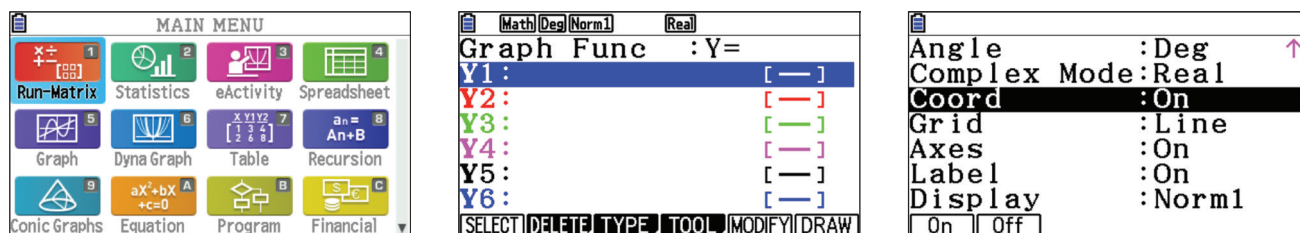


GRAPH

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

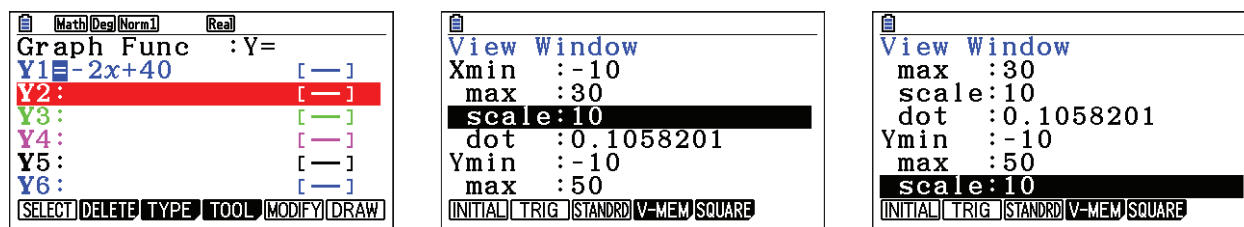
The first screen is the function/relation editor. To select how certain results will be displayed, press **[SHIFT]** **[MENU]** (**SET UP**). The suggested selections for **Coord**, **Grid**, **Axes** and **Label** are shown. Scroll down to these selections. To make a change, highlight the item and use 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.



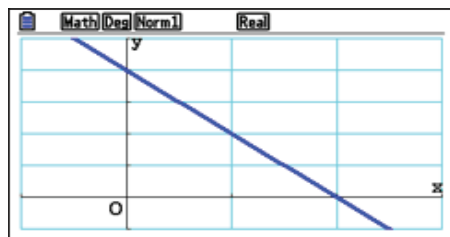
The Math Club plans to sell t-shirts. Previous experience suggests that the number of t-shirts sold depends on the price. A good model for the number sold, y , as a function of the price, x , is $y = -2x + 40$.

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.

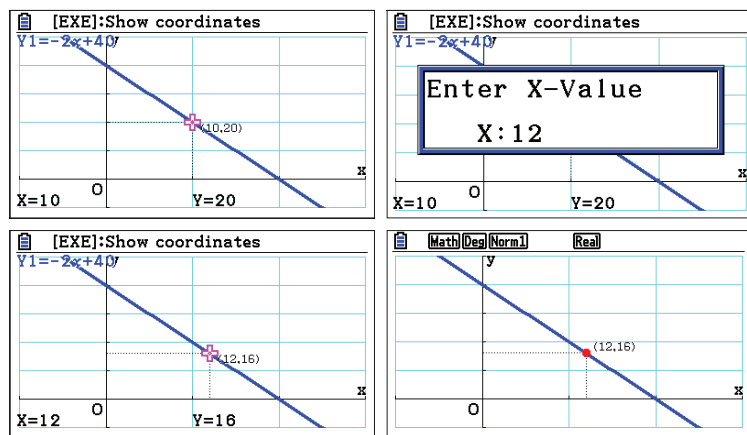


To draw the graph, press **[F6]** (**DRAW**). When a graph is displayed the **[+]** key can be used to zoom in, the **[−]** key to zoom out, and **[▶]** **[◀]** **[▲]** **[▼]** to scroll.



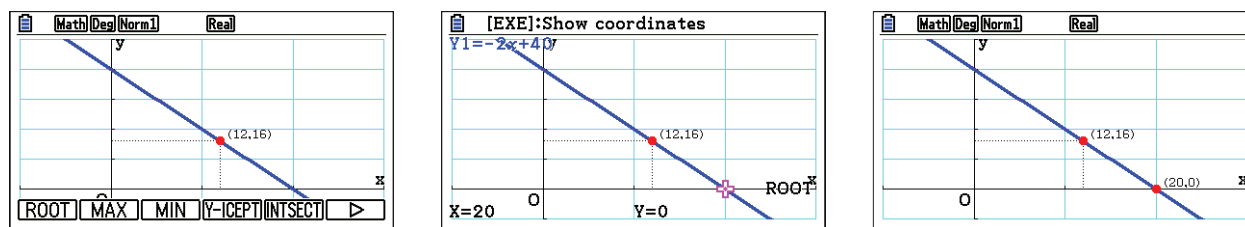
2. How many shirts would be sold at a price of \$12 per t-shirt?

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 $-2x + 40 = 0$.

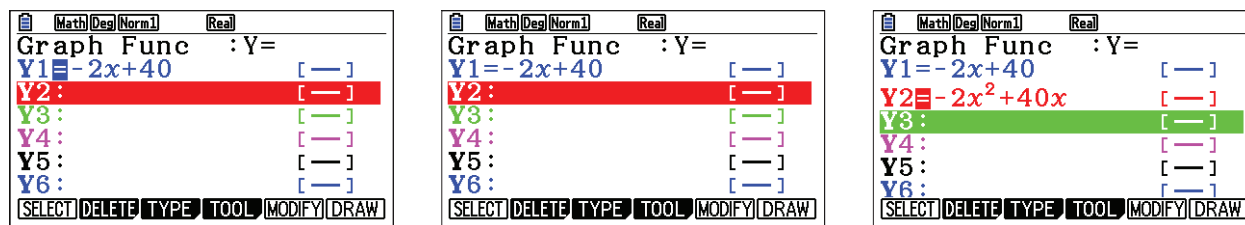
To find the root, press **SHIFT** **F5** (**G-Solv**) **F1** (**ROOT**). The result, \$20, is shown at the bottom of the screen. To mark this intercept and keep the coordinates on the display, press **EXE** a second time.



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

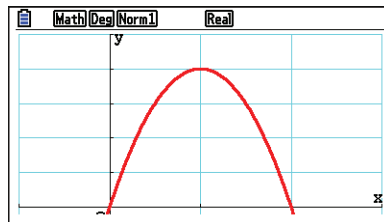
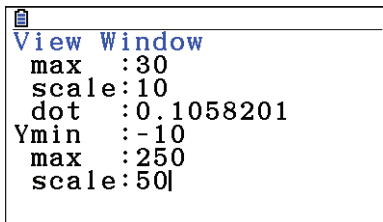
To graph this function, first, deselect the previous equation by pressing **EXIT**, **▲** so the cursor is on **Y1**, then press **F1** (**SELECT**) **▼**. Note, the = sign is not highlighted. The cursor should now be on **Y2**.

Press **(←)** **2** **X,θ,T** **x²** **+** **4** **0** **X,θ,T** **EXE**.



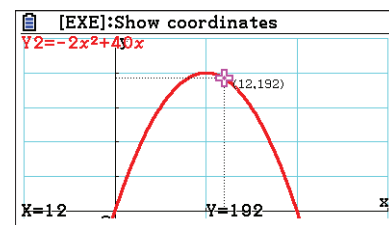
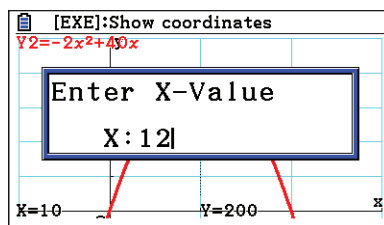
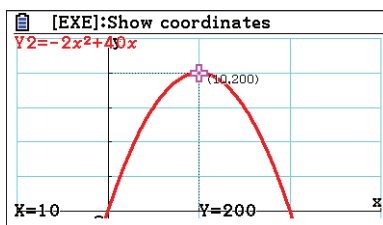
GRAPH

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**).



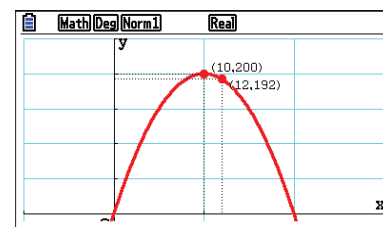
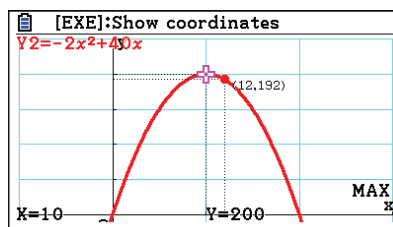
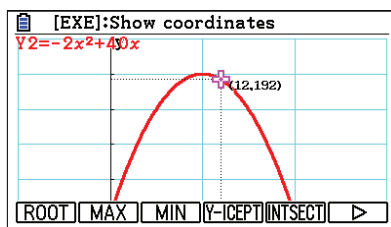
5. Compute the number of dollars earned, if each t-shirt is sold at \$12.

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.



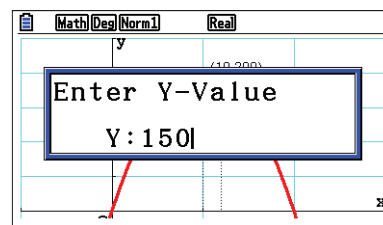
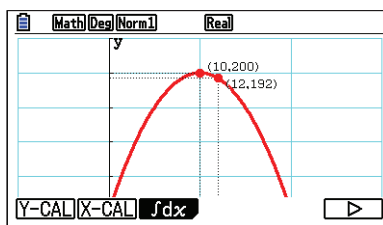
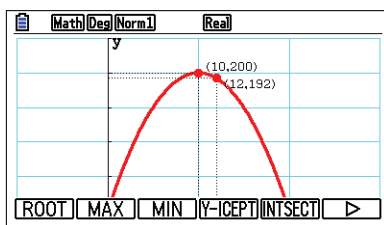
6. Determine the price that will give the greatest profit.

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**.

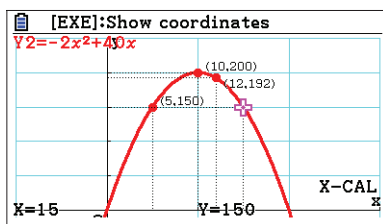
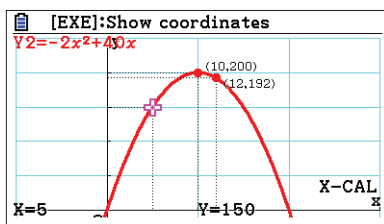


7. Determine the price of each t-shirt in order to collect \$150.

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.)

