# Demo: Key Features of a Parabola

The purpose of this lesson is to explore the graphs of quadratic equations generated by a given equation. You will be asked to:
a) Graph your equation on a Graphs & Geometry page of Ti-Nspire
b) Adjust the window settings from a grid provided
c) Use the trace features of TI-Nspire to find specific ordered pairs
d) Sketch your graph and ordered pairs on the grid provided

Sample Example: A water balloon is thrown into the air so that its height y, in metres, after x seconds, is given by the equation
$$y = -4.9x^2 + 27x + 2.4$$

Grid provided
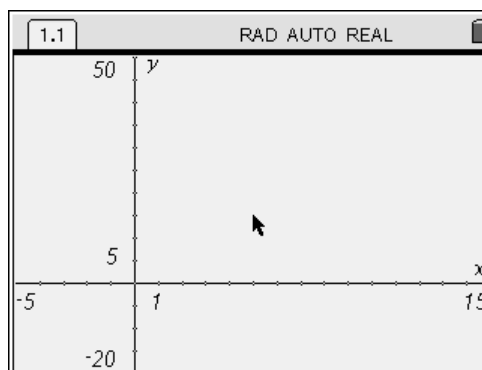
Press 🏠 8 1 and under **Display Digits** select **Float 2** by clicking on the pull down menu. Press ≈enter.
Use the tab key to tab down to **Apply to System** and press ≈enter. Click on **OK** when asked "Do you wish to apply current settings to system settings?".

Press 🏠 6 to open a new document and Select **2:Graphs and Geometry**.
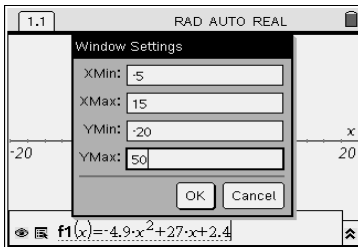(If you are asked if you wish to save a previous document, click on "No").
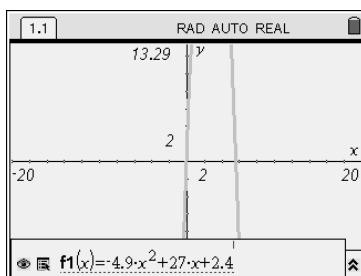
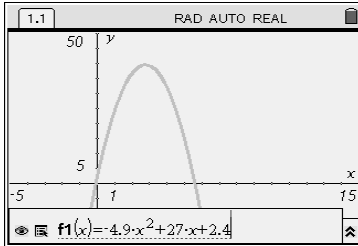Type in the equation in the **f1** position at the bottom of your screen. Press ≈enter
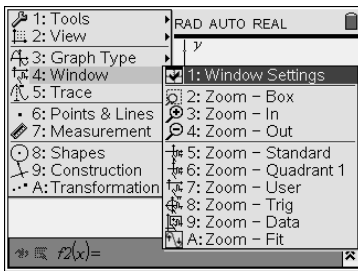
In order to zoom in on the important part of your graph, adjust the window settings by pressing (menu)(4)(1).

Type in the new values for your window from the grid provided with the example. Use the (tab) key to move from one box to the other. Click on **OK** .
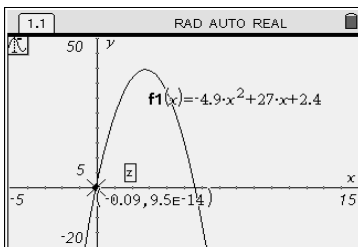
You now have a better view of your graph. Sketch your graph on the grid provided.

To get rid of the equation entry at the bottom of the screen press (ctrl)(G).
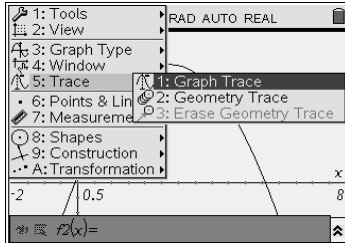
Press (menu)(5)(1) in order to trace on your graph to locate specific points.

The first point you will see is **an x-intercept**. You know it is an x-intercept because of the small **z** for zero that appears on the screen. Record this point as (-0.09,0) on your sketch, as 9.5E-14 can be considered as 0 for this context.
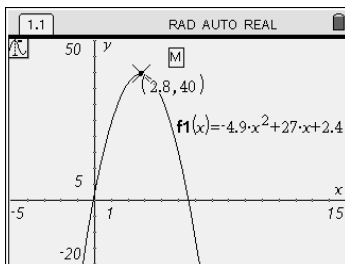
Use the right arrow key on the nav pad to move your point along the graph. You will know you have reached **the vertex** of the graph when you see an **M** appear. (M stands for maximum) Record this point on your sketch. Interpret its meaning relative to the context of the water balloon.
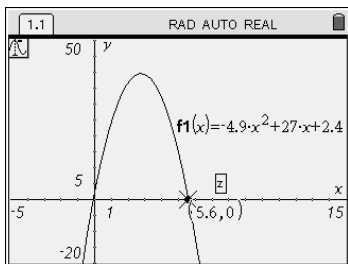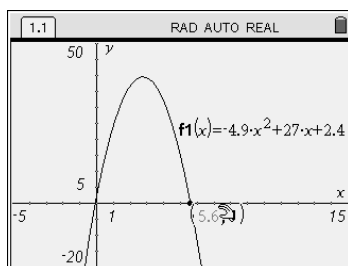
Continue tracing using the right arrow on the nav pad until you reach **the other x-intercept**. (You will know it is the intercept when a small **z** appears beside your point.)
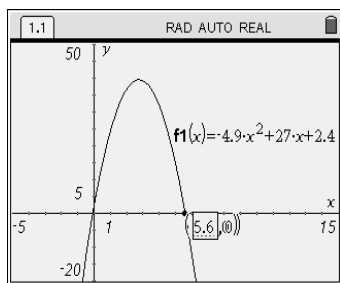Record this point on your sketch.
Interpret its meaning relative to the context of the water balloon.
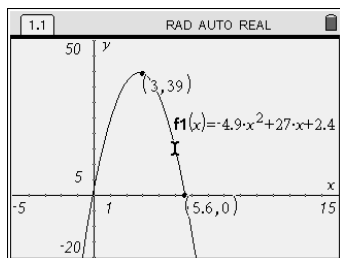
By Pressing (enter)(esc) you can keep the ordered pair on the screen.

Move the cursor over the ordered pair until a hand appears.Press (enter) (enter).

You now have the capability to delete the number 5.6 and type in a new x-value. For example, use the (clear) button to erase 5.6 and type in 3. Press (enter)

The cursor will jump to the closest ordered pair that has an x value of 3.

This method can be used to search for other specific points on a graph.