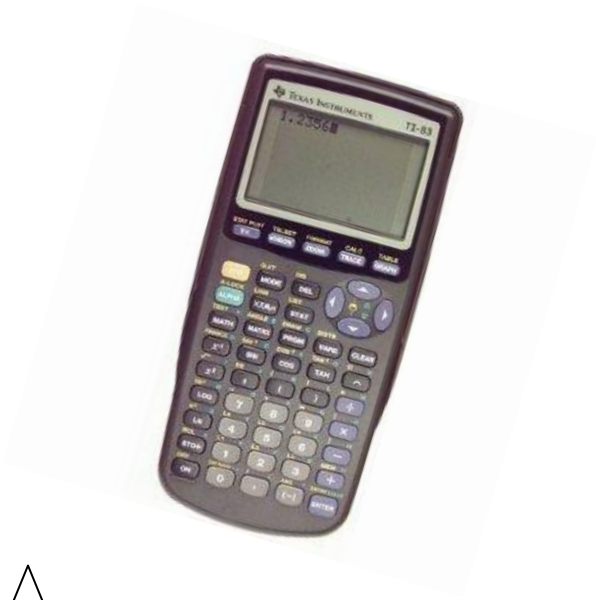
Algebra Concepts – Unit 1 Lesson 5

Graphing NON-Linear Functions with a graphing calculator

Linear models are very common in life and they can be very useful predictors. However, not all models are linear. If there is not a constant rate of change then the situation is not linear. (Think of the Saco river after a hard rain. Its depth doesn't increase at a constant rate. Nor does it decrease again at a constant rate). The two non-linear function types we are focused on in this course are quadratic and exponential functions.



New important buttons. Find them and love them.

x^2 ^

Let's try an example

Graph the equation $y = x^2$ using the standard window settings.

The standard window settings are:

Xmin = -10

Xmax = 10

Xscl = 1

Ymin = -10

Ymax = 10

Yscl = 1

Reminder

Step 1 – Check the window. Adjust the settings as needed. The direction arrows are the top right corner of your calculator.

Step 2 – Type the equation into $Y_1 =$

Step 3 – Press the GRAPH button.

What do you see?

What type of function is $y = x^2$?

Guided Practice 1

Graph $Y = X^2 - 4$ in the same window. Use Y_2 instead of deleting the existing equation.

Sketch it!

Now change the window to:

Xmin = -20

Xmax = 20

Xscl = 1

Ymin = -5

Ymax = 5

Yscl = 1

What happened to the graphs???

Now adjust the window so that the graphs are wider. Fill in the blanks below to show the window settings you used.

Xmin = _____

Xmax = _____

Xscl = 1

Ymin = _____

Ymax = _____

Yscl = 1

Guided Practice 2

Reset the window to:

Xmin = -10

Xmax = 10

Xscl = 1

Ymin = -10

Ymax = 10

Clear the equation out of Y=

Graph the equation $Y = X^2 - 12$ on the calculator.

What's up?

Notice that you cannot see the place where the parabola changes direction (the vertex). Adjust the window so that you can see where the graph turns.

Fill in the window settings that you used.

Xmin = _____

Xmax = _____

Xscl = 1

Ymin = _____

Ymax = _____

Yscl = 1

Guided Practice 3

Reset the window to the standard settings.

Graph these two equations using your calculator and sketch the graphs:

$Y_1 = X^2 - 6X$

$Y_1 = X^2 + 6X$

Now adjust the window to make a rounder football.

Guided Practice 4

Graph the equation $y = 2^x$ using the standard window settings and sketch the graph.

What type of function is $y = 2^x$?