Creating: Transformations of a Quadratic Function
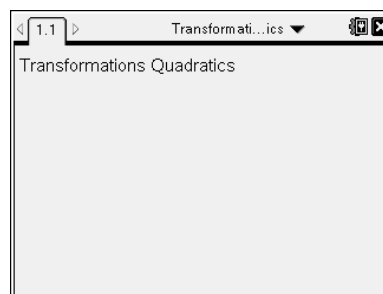**MATH NSPIRED**

Activity Overview

In this activity, you will create and use sliders to investigate transformations of quadratic functions in a Graphs application.

Materials

- *Technology needed (TI-Nspire™ handheld, computer software)*

Steps

Step 1:   Preparing the document

1. Open a new document by clicking ⌂(on) > **New Doc >
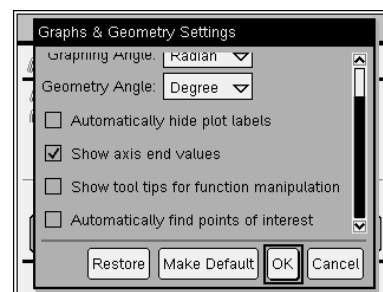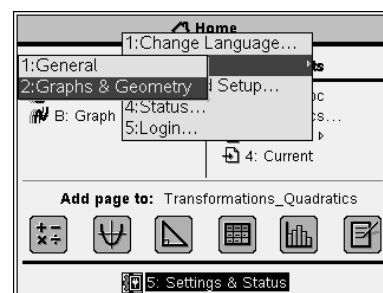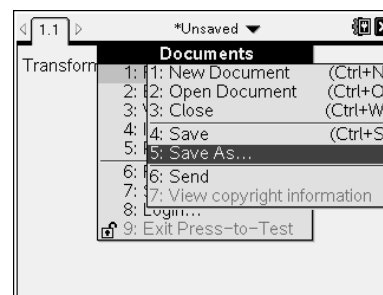   Add Notes.**

2. Type: Transformations Quadratics.

Note: To obtain capital letters, press the (⇧shift) key, then the letter.

3. Press (doc▾) **> File > Save As ….**
   Type: Transformations_Quadratics.
   Tab to ⌜save⌝ and press (enter).

Note: To obtain the underscore, press (ctrl) (␣).

4. To add a new page, press (ctrl) (doc▾) **> Add Graphs.**

5. Press (⌂on) **> Settings & Status > Settings > Graphs &
   Geometry.** Press (tab) to move from one field to the next and
   press 🔘 to uncheck all the boxes except *Show axis end values*.
   Tab to OK and press 🔘 or (enter). At the Home screen press the
   number next to the word *Current* to return to the current file.

Step 2:   Insert a slider

1. Select **Menu > Actions > Insert Slider.**

2. Use the Touchpad or Clickpad to move the slider to the upper left
   corner of the screen. Press 🔘 to place the slider there.

3. The default parameter name *v1* is highlighted.
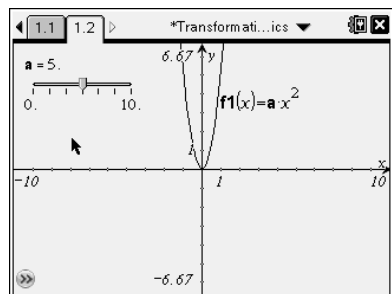   To rename the parameter to **a,** press **A** and then (enter).
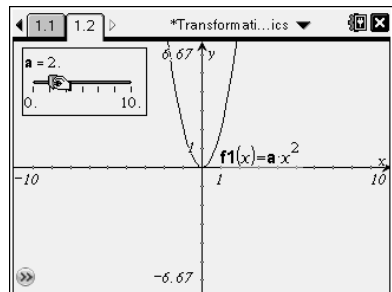
Step 3:   Type a function into f1(x)

1.   Press (tab) until the cursor is in the **f1(x) =** entry line at the
     bottom of the screen.

2.   To graph the equation $y = a \cdot x^2$, type [A] (×) [X] (x²) (enter).

Note: It is graphing the equation with the current value of **a.** Also, the
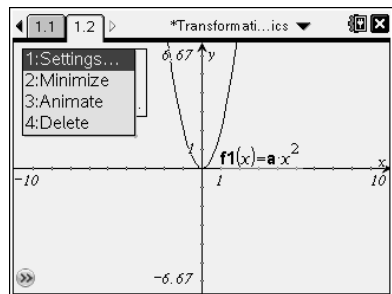times sign is essential here. You must type it.

Step 4:   Change the value of *a* using the slider

1.   Use the slider to change the value of the parameter variable. To
     do so, move the cursor so that it hovers above the button on the
     slider. Press (ctrl) [🖰] to grab the button.

2.   Use the Touchpad or Clickpad to move the button left and/or
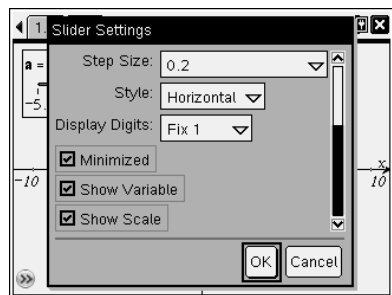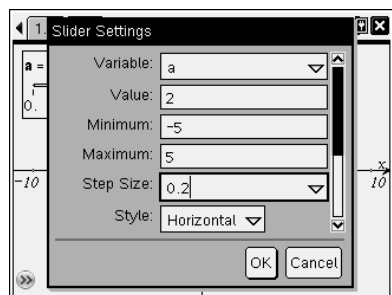   right.

3.   Observe the changes in the graph. Press (esc).

Step 5:   Open the slider settings menu

1.   Move the cursor so that it is inside the slider box.

2.   If the outline of the box is dotted, press [🖰] to make the box solid.
     If it is solid, proceed.

3.   Press (ctrl) (menu) to obtain a drop-down menu.

Step 6:   Change the slider settings

1.   Press (enter) for **Settings.**

2.   Press (tab) to move to the *Value* box. Type *1* for the initial value.

3.   Press (tab) to move from one box to the next. Type in the values
     as shown at the right.

4.   Press ▼ at the Display Digits box and continue to press ▼ until
     Fix 1 is highlighted. Press (enter).

5.   Press [🖰] to check or uncheck a box as shown at the right.

6.   Then (tab) to OK and press (enter).

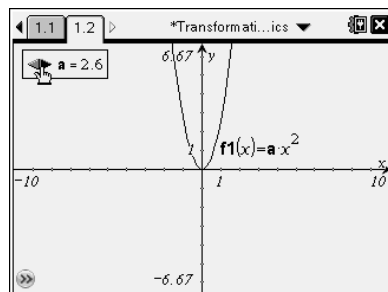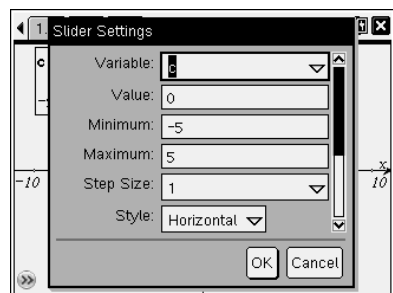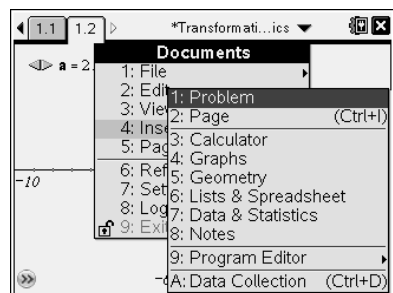**Step 7: Investigate more with the slider**

1. Since the slider is minimized, it performs differently. Move the cursor inside the slider box and hover over the two arrows until you see 👆. Press 🖻 and one of the horizontal arrows will get darker. Then press the right arrow ▶ to increase the value of *a,* or press the left arrow ◀ to decrease the value of **a.**

Note: You are encouraged to change the slider settings and experiment with those other settings.

Step 8: Add a new problem

1. To add a new problem, press (doc▾) **> Insert > Problem.**

2. Add a new Graphs page: press **Menu > Add Graphs.**

3. Using steps 2 through 7 above, insert a slider to control the variable *c* in the equation $y = x^2 + c$.

4. Have the slider go from –5 to 5 in steps of 1 with an initial value of 0.

Step 9: Save the document when finished

1. Press (ctrl) ⎣S⎤.