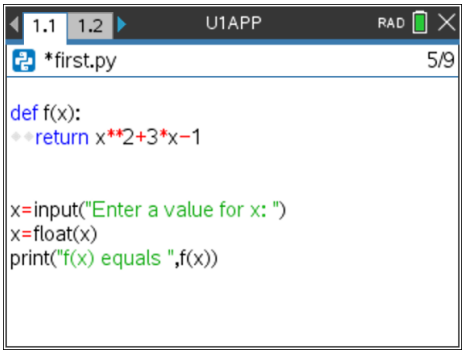
Unit 1: Getting Started with Python | **Application: Two Functions Are Better Than One**

In this application you will make a second function and use both functions to investigate some of the mathematical properties of functions.

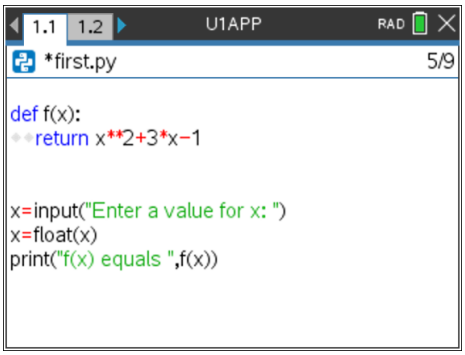
Objectives:

- Editing a Python file
- Copying a Python file
- Adding a function
- Evaluating function expressions in the Shell
- Creating an inverse function.

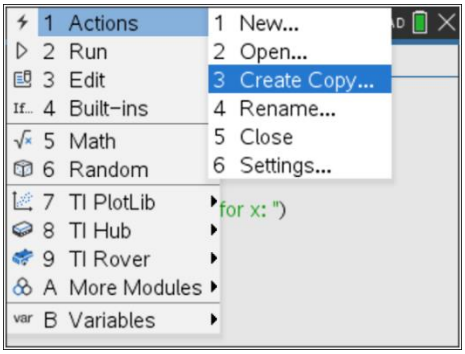
In the last lesson (**Unit 1, Skill Builder 3**) you defined a function f(x). In this application you will add another function to that file and then evaluate some expressions using those functions.



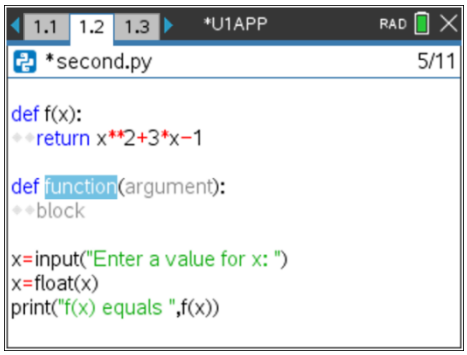
1. Begin with the TI-Nspire document with the Python program you used in Skill Builder 3. See the image.
   Save the TI-Nspire document using a different name by pressing **doc > File > Save As…** and use a different name. The title bar in the image shows the new name U1APP.



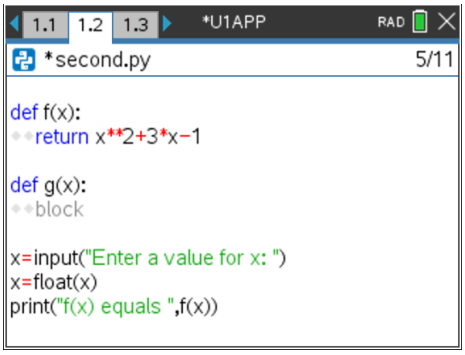
2. Make a *copy* of the Python program by pressing **menu > Actions > Create Copy…** in the Python Editor.
   Give the copy another name (the default adds a 1 to the end of the name).
   (if **Create Copy…** is unavailable, press **ctrl+B** in the program to store it. There should be no asterisk in front of the Python filename on the top of the Editor).
   This creates another Python Editor app containing the duplicate code in the document.



3. Our new Python filename is **second.py**.
   Now add a second function template below the function f(x):
   On a blank line press **menu > Built-ins > Functions** and select **def function()**.
   Again, the syntax for the function structure includes a colon (**:**) at the end of the **def** line. This indicates that the following code is the definition of the function and the block is indented.



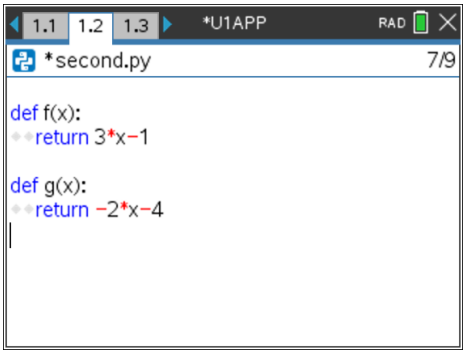
4. Name this second function **g**(x).



5. Change f(x) by removing **x**2+** from the function so that **f(x) = 3 * x - 1**.
   Define g(x):

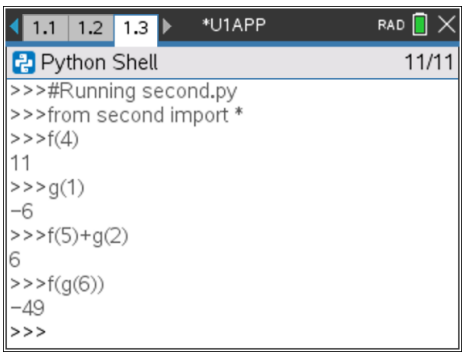
```
def g(x):
    return -2*x - 4
```

   Delete the 3 lines of code at the bottom of the program leaving only the two functions.



6. Press **ctrl+R** and enter the expression f(1)+g(1).

   Try other expressions using both functions like:
   f(4)+g(1), f(5)+g(2), (f+g)(4), f(g(6))



7. **Other functions**

Are you ready for this? Back in the Editor, change **g(x)** so that

$$f(g(x)) = g(f(x)) = x$$

regardless of the value of x. Test your functions carefully.

Challenges: create a function that is parallel to or perpendicular to f(x).