

Meet the TI-Rover

TI-Nspire CXII

Python

Texas Instruments

@ticalculators

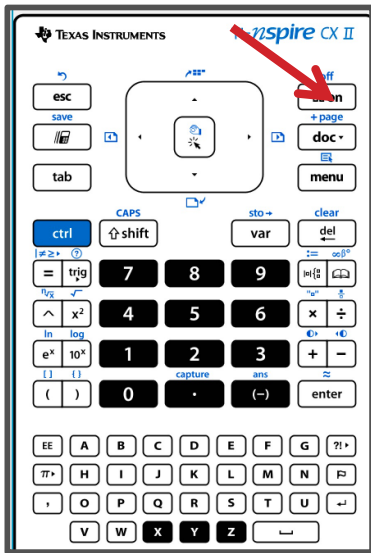


Meet the TI-Innovator Rover



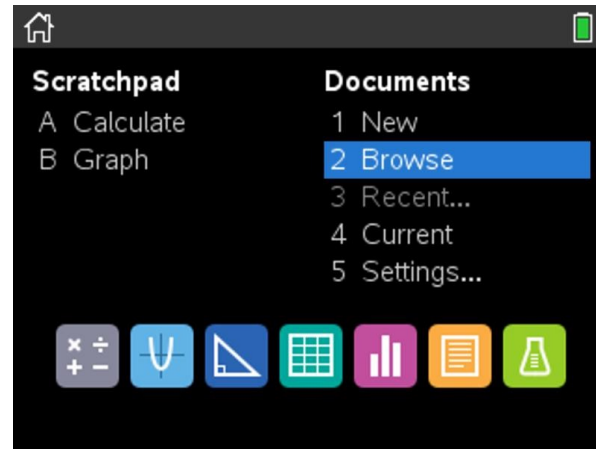
Opening an existing TI-Nspire document file

1



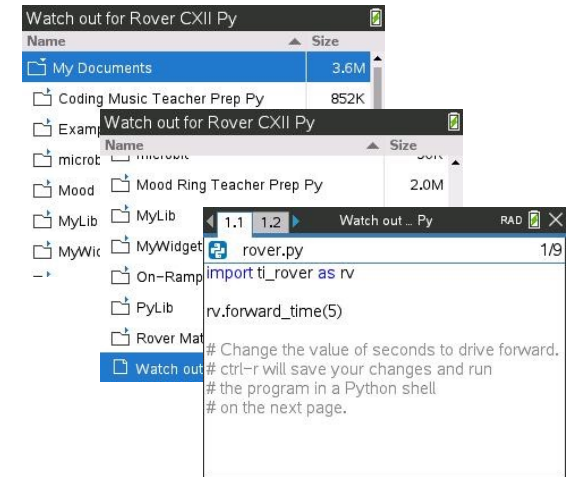
Press the **[home/on]** key to display the home screen.

2



Use **arrow keys** and **[enter]** or Press **[2]** to select 2 Browse files.

3



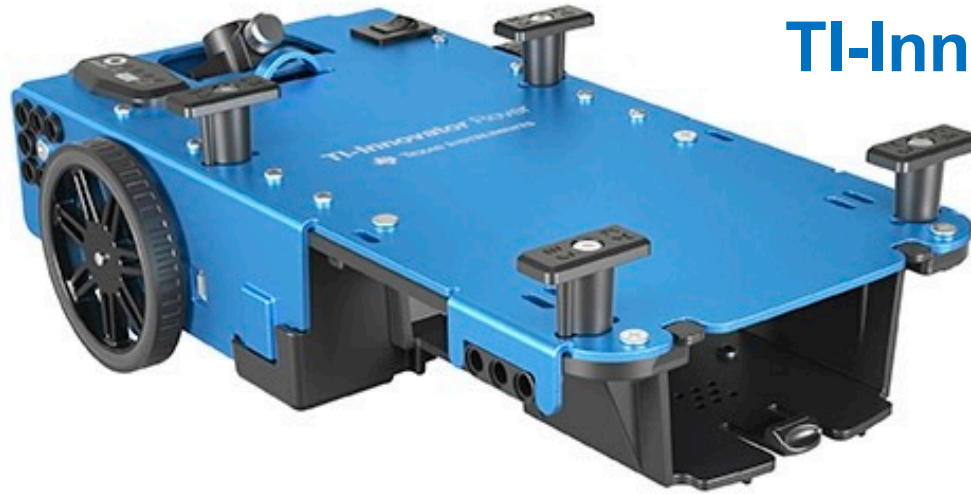
Use **arrow keys** and **[enter]** to select a folder and a file.

Note: Pressing the **[home/on]** key repeatedly toggles between the home screen and the current document.

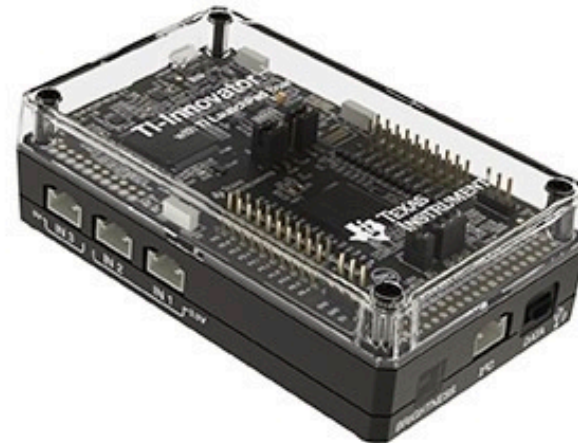
TI Graphing Calculator



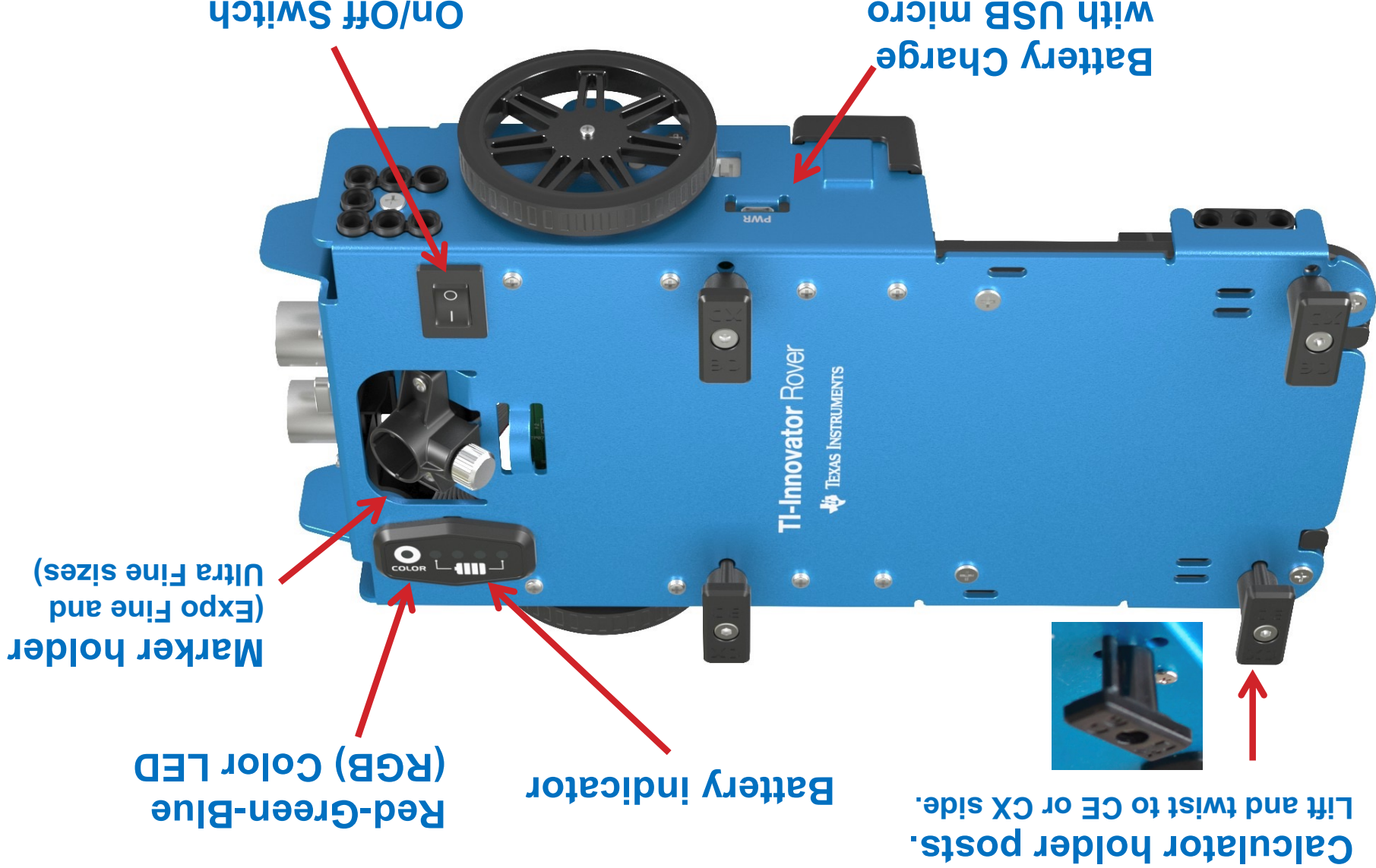
TI-Innovator™ Rover



TI-Innovator™ Hub

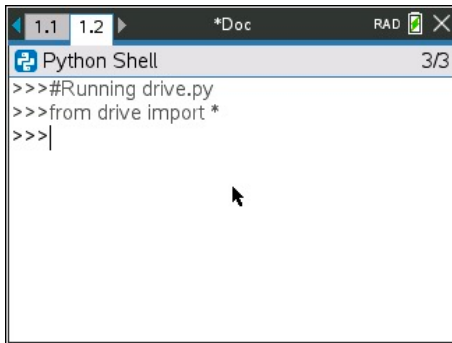


Rover from the top



Editing a Rover Program

1



```
Python Shell 3/3
>>>#Running drive.py
>>>from drive import *
>>>|
```

Press **[ctrl] left** to go back to your Python editor page.

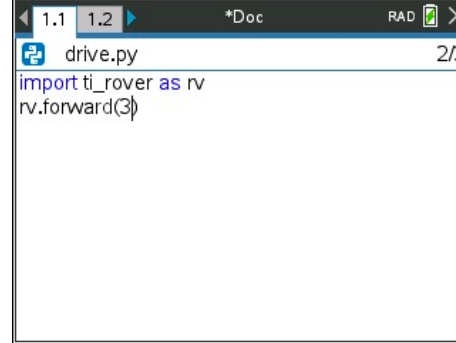
2



```
*rover.py 3/5
import ti_rover as rv
rv.forward(3)
|
```

Use the arrow keys to position the cursor to change the value of the forward distance.

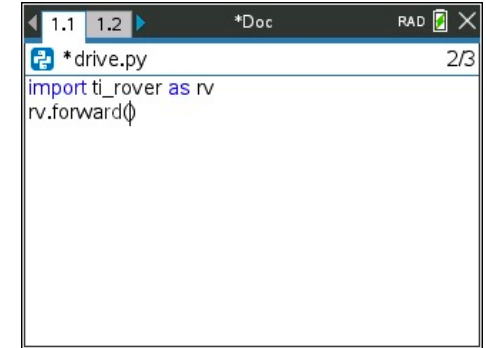
3



```
drive.py 2/3
import ti_rover as rv
rv.forward(3)
|
```

Press **[del]** to backspace over the 3.

4



```
*drive.py 2/3
import ti_rover as rv
rv.forward( )
|
```

Type in a new value for distance, **right arrow** to the end of the line, then **[enter]** to move to the next line.

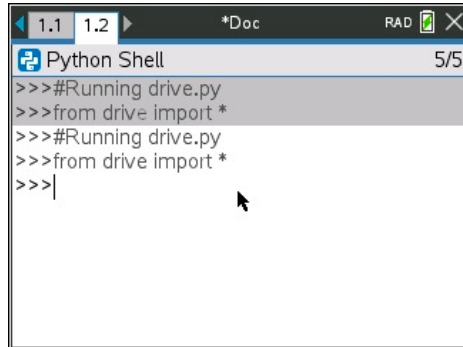
5



```
*drive.py 3/4
import ti_rover as rv
rv.forward(5)
|
```

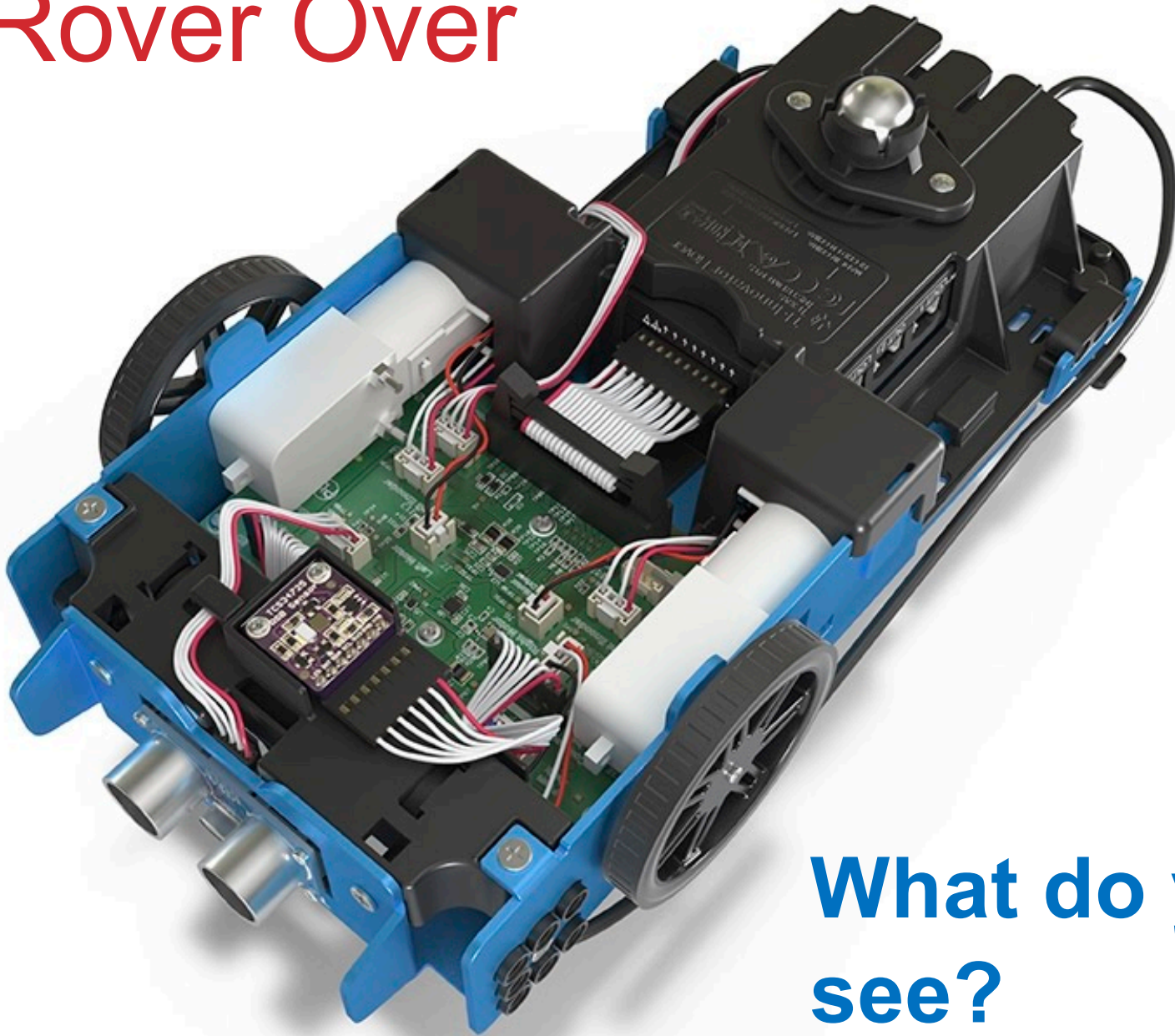
Press **[ctrl] [R]** to run the program again from a Python shell on the next page.

6



```
Python Shell 5/5
>>>#Running drive.py
>>>from drive import *
>>>#Running drive.py
>>>from drive import *
>>>|
```

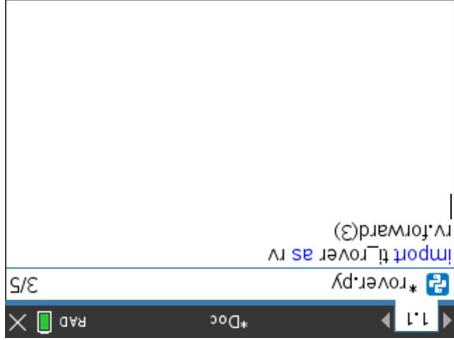
Turn Rover Over



What do you
see?

Running a Rover Program

1



```
python t_lrover as rv
rv.forward(3)
```

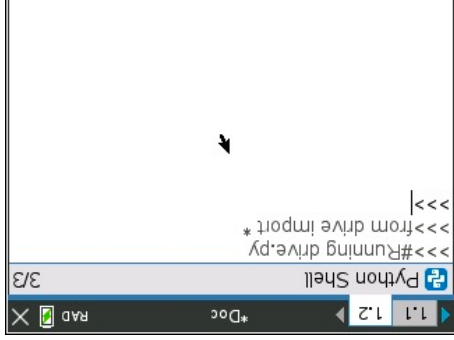
Press **[ctrl] [R]** to run the program from a Python shell on the next page.

Note: **[ctrl] [R]** also checks syntax and stores program changes. **[ctrl] [B]** is another option for checking syntax and storing. * before the program name indicates that changes have not been stored.

Before running the program make sure that

- Rover is connected to the calculator
- Rover is switched on
- Rover is on a flat surface ready to roll

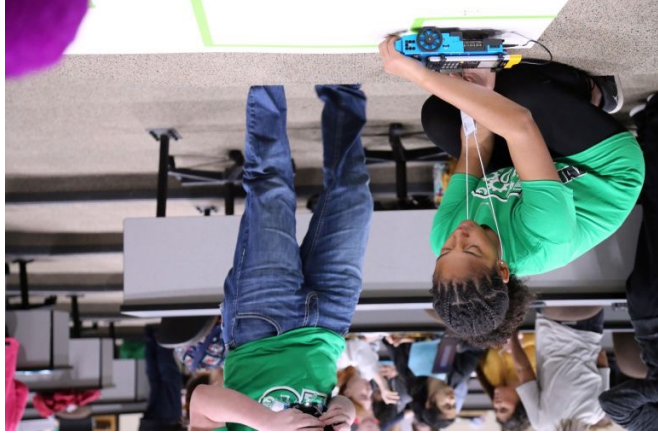
2



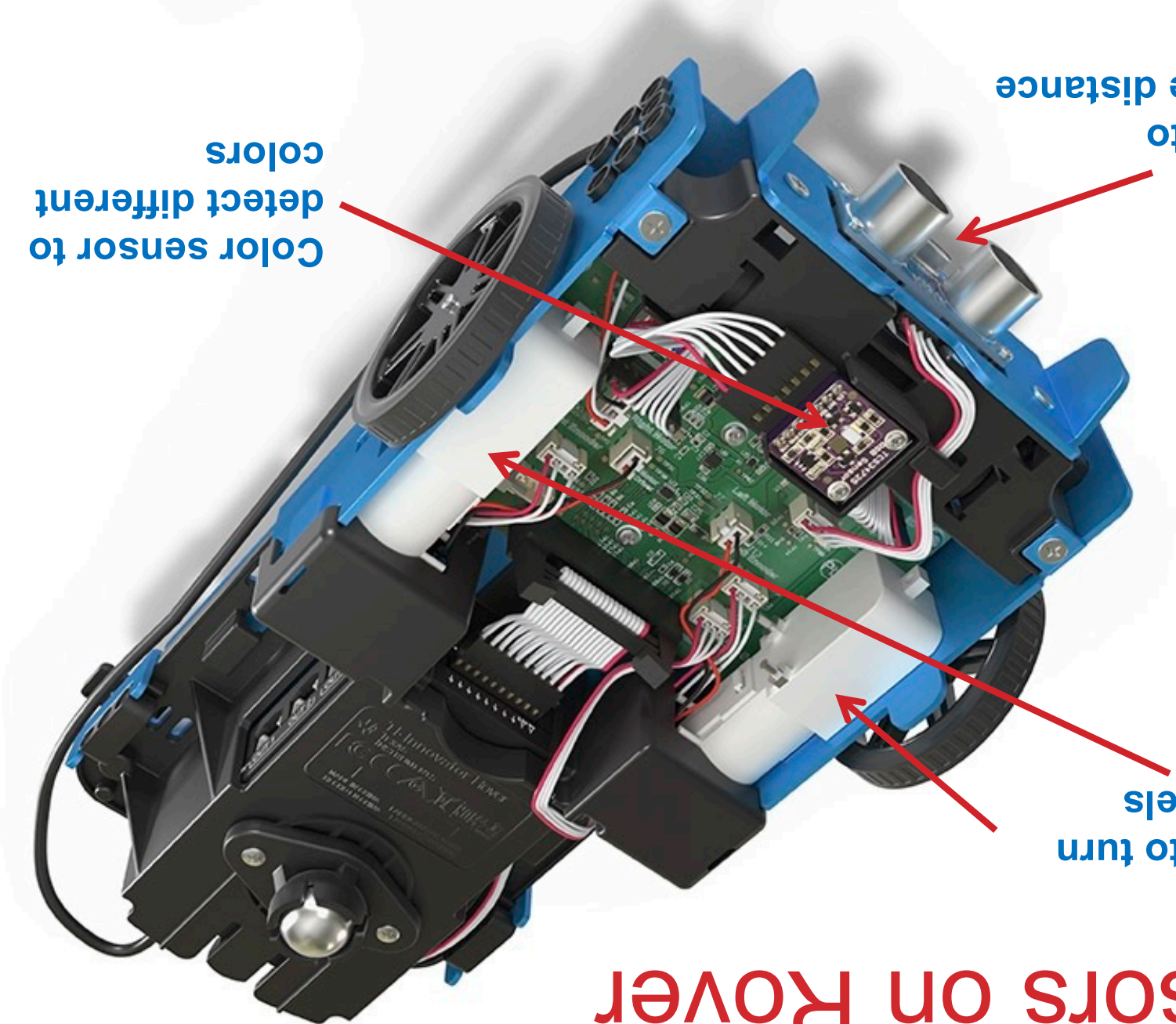
```
python drive.py
from drive import *
```

Your program runs in a Python shell.

You can re-run the program from the shell by pressing **[ctrl] [R]** again.



Sensors on Rover

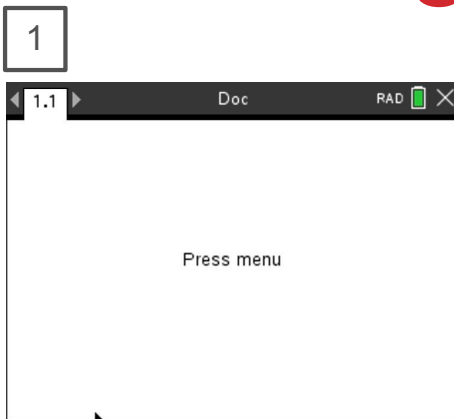


Motors to turn the wheels

Ranger to measure distance

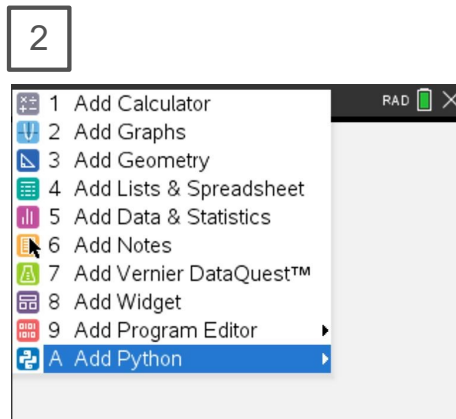
Color sensor to detect different colors

Creating a Rover Program

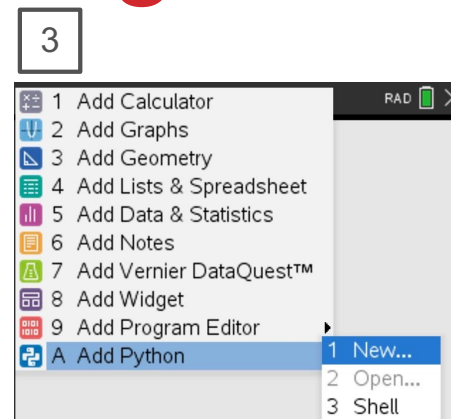


Press **[menu]** to bring up a menu of applications to add to the page.

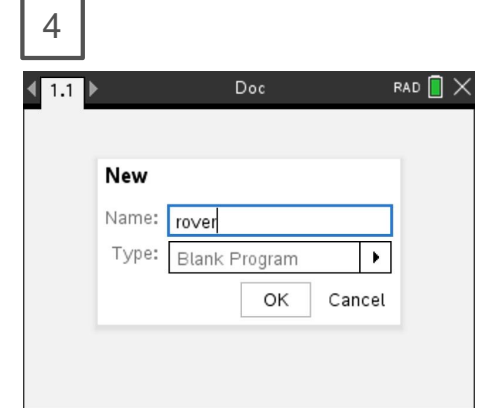
Note: You can also add a new page to the document by pressing **[ctrl] [doc] +page**.



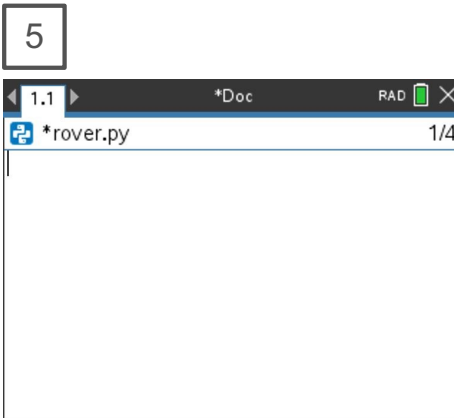
Press **down arrow** repeatedly then press **[enter]** or press **[A]** to select Add Python.



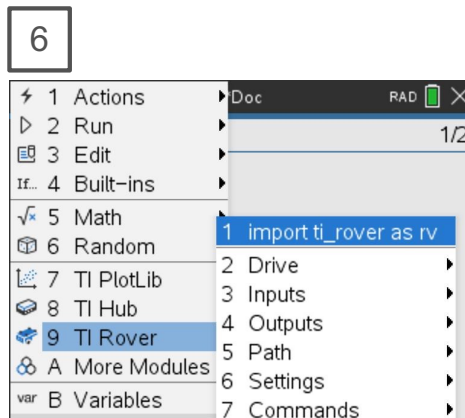
Select 1: New by pressing **[enter]** or **[1]**



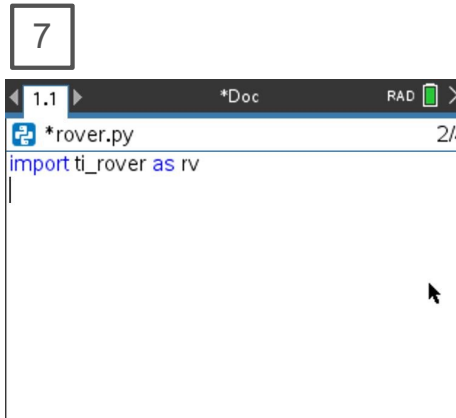
Enter your program name and press **[enter]**.



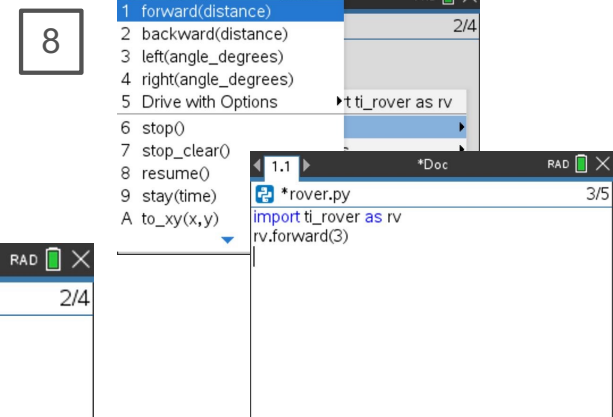
You begin at a blank edit screen.



Press **[menu]** then **[9]** TI Rover **[1]** Import ti_rover.

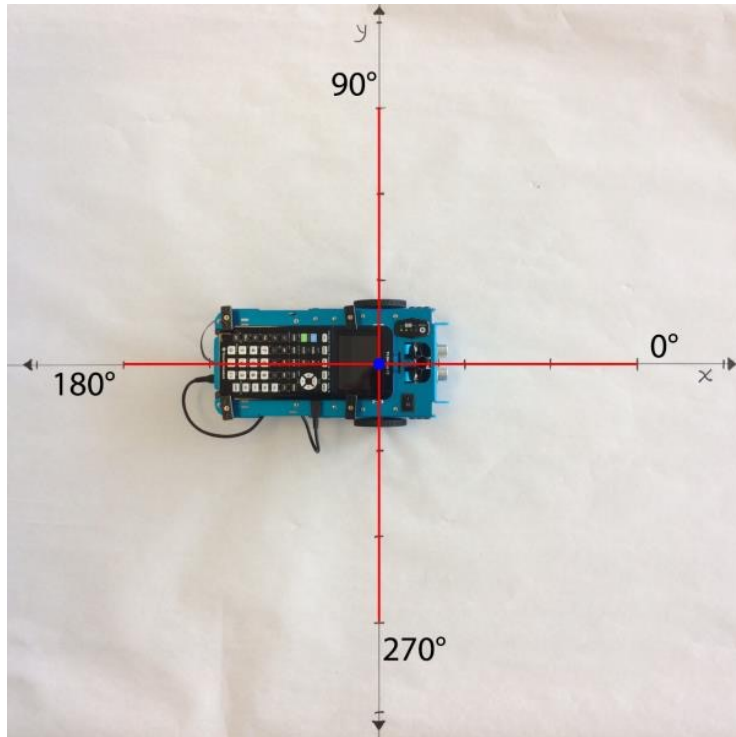


Importing the ti_rover module is required at the beginning of every Rover program.



Press **[menu]** then **[9]** TI Rover **[2]** Drive **[1]** forward() to paste to the edit line. Type a value for units to drive. **Right arrow** to the end of the line and press **[enter]** to complete the statement.
Press **[ctrl] [R]** to run the program from a Python shell on the next page.

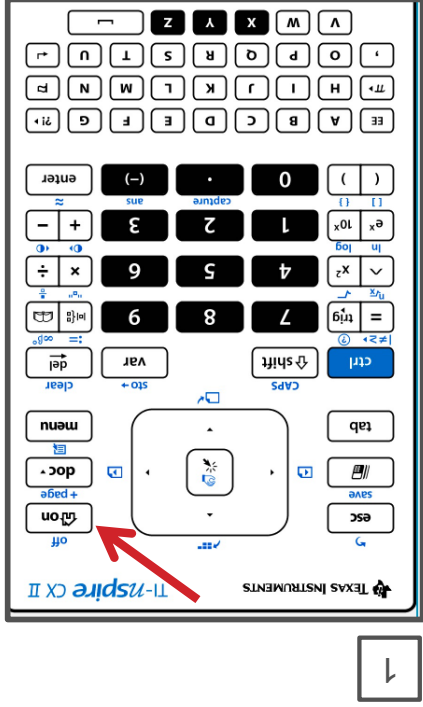
TI-Rover orientation and virtual grid



Rover programs set the initial position as the origin and the heading as 0 degrees measured from the x-axis.

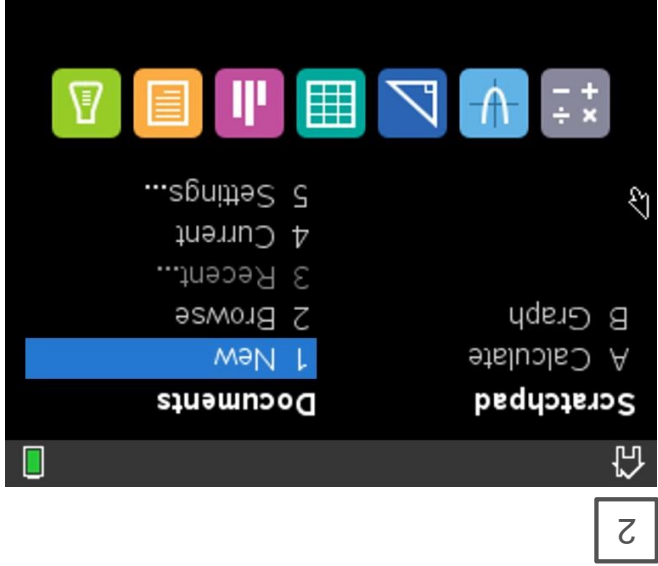
Note: The Rover tracks its position on a virtual coordinate grid with a unit value of 10 cm. The coordinate grid position applies to the `to_xy(x,y)`, `to_polar(r,theta_degrees)` and `to_angle(angle, "unit")` functions on the Rover Drive menu. The virtual grid also applies to Path menu functions.

Creating a new TI-Nspire document

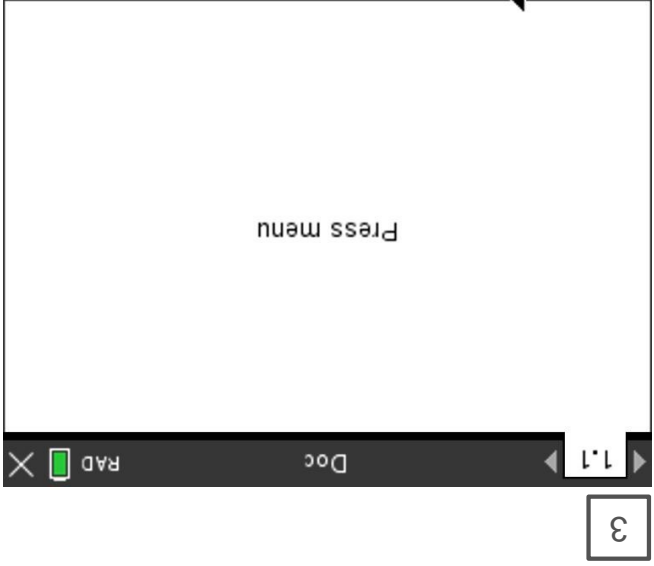


Press the [home/on] key to display the home screen.

Note: If you have a document open, pressing the [home/on] key repeatedly toggles between the home screen and the document.



Use **arrow keys** and [enter] or Press [1] to select 1 New document.



See next slide for steps to add a program.

Connecting Rover to your calculator

Make sure that your Rover is switched on and on floor ready to roll before running the program.

3



1

Plug B side into USB B port of the Rover Hub.

Plug A side into port on calculator the Rover Hub.

2



Unit-to-unit cable