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# TRAPEZOID PROGRAM MANUAL

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SOURCE: [HTTPS://LIKEGEEKS.COM/ES/EJEMPLOS-DE-LA-GUI-DE-PYTHON/](https://likegeeks.com/es/ejemplos-de-la-gui-de-python/)

## 1. HOW DOES THE PROGRAM WORK?

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Download the project from:

[https://github.com/shimadasoftware/trapezoid\\_method](https://github.com/shimadasoftware/trapezoid_method)

Once downloaded, run the following command in the terminal:

**python trapezoid.py**

```
juana@localhost:/run/media/juana/Datos/Documents/U/5/méto...
Archivo Editar Ver Buscar Terminal Ayuda
(base) [juana@localhost Proyecto]$ python --version
Python 3.8.3
(base) [juana@localhost Proyecto]$ pwd
/run/media/juana/Datos/Documents/U/5/métodos numéricos/Proyecto
(base) [juana@localhost Proyecto]$ ls *.py
trapezoid.py
(base) [juana@localhost Proyecto]$ python trapezoid.py
```

Figure 1: Run the project in terminal



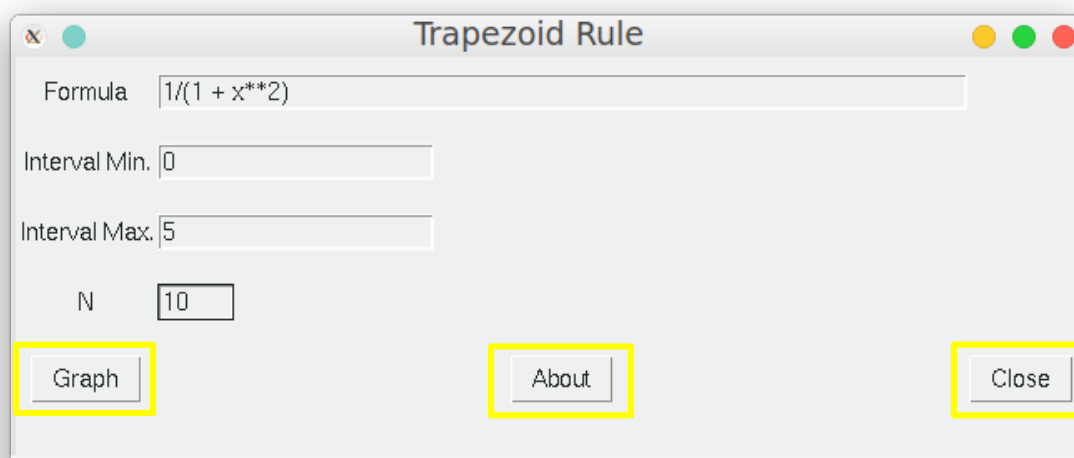
Run the project. Then a main pop-up window will appear (figure 1). The pop-up window consists of a title, labels, fields to fill in, and buttons to select. The first field is intended to place the formula. The second field is to put the minimum number of the interval and the next one for the maximum number of intervals. In the last field, you must indicate the number of divisions of pieces in the graph.

A screenshot of a macOS-style pop-up window titled "Trapezoid Rule". The window has a light gray background and standard window control buttons (red, yellow, green) in the top right corner. It contains four input fields, each highlighted with a yellow rectangular border: a "Formula" field at the top, followed by "Interval Min.", "Interval Max.", and "N" (representing the number of divisions). At the bottom of the window, there are three buttons: "Graph", "About", and "Close", arranged horizontally.

*Figure 2: The main pop-up window*



Next, the data will be filled with the following example (figure 2):



*Figure 3: Fill data*

In addition, there are three buttons that will lead to pop-up windows. The first corresponds to the window that projects the graph, the second button shows the information and copyright of the project, and the last button closes the window that is projected.



Once the first button is pressed, the following pop-up window will be displayed (figure 3):

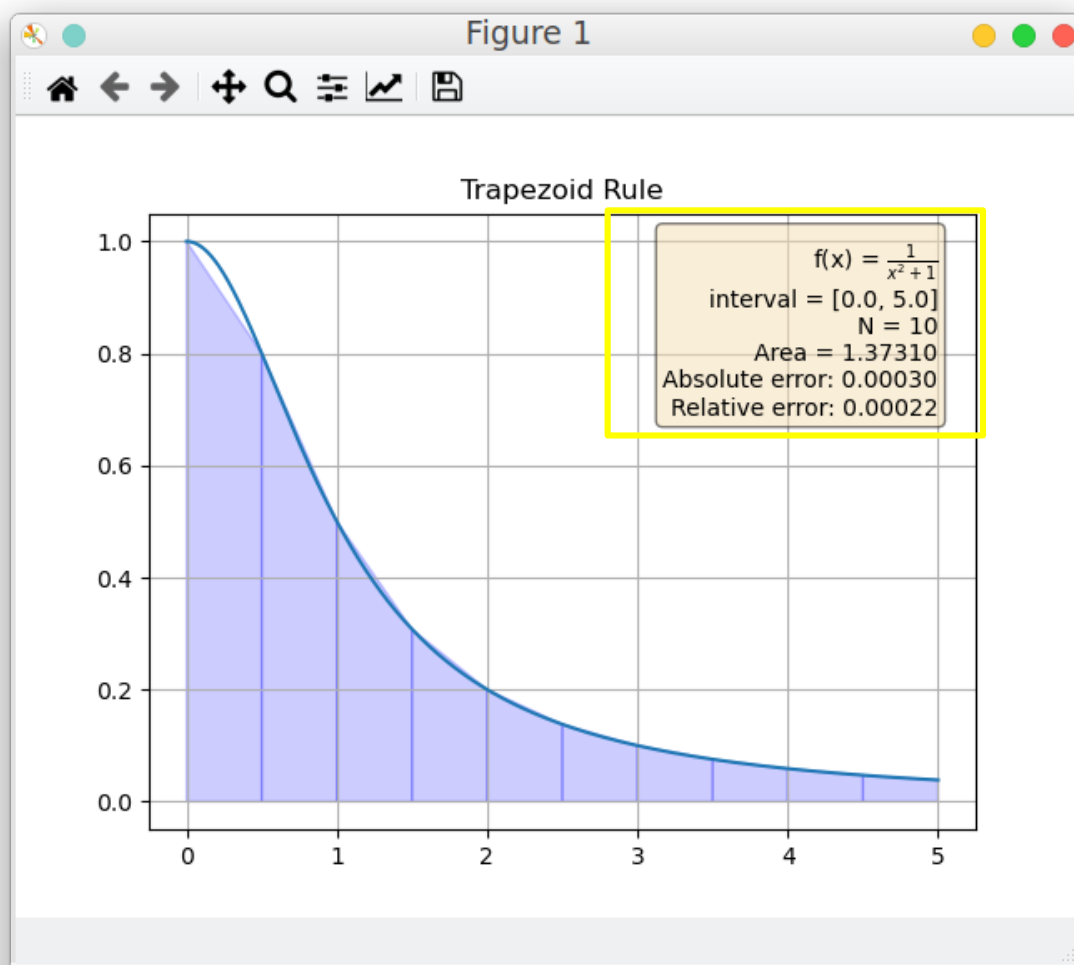


Figure 4: Pop-up window projecting the graph

The window is made up of a title, an options bar, the graph, a box with the formulas, and the respective results. The yellow box that is projected is composed of the chosen function, the managed interval,  $n$  which is the number of trapezoids that divide the graph, the total result which is the area, the absolute error and the relative error.



The options bar is made up of eight buttons. The first button allows you to reset the graph, that is, to return it to its initial state after any modification that has been made with the other buttons (figure 4).

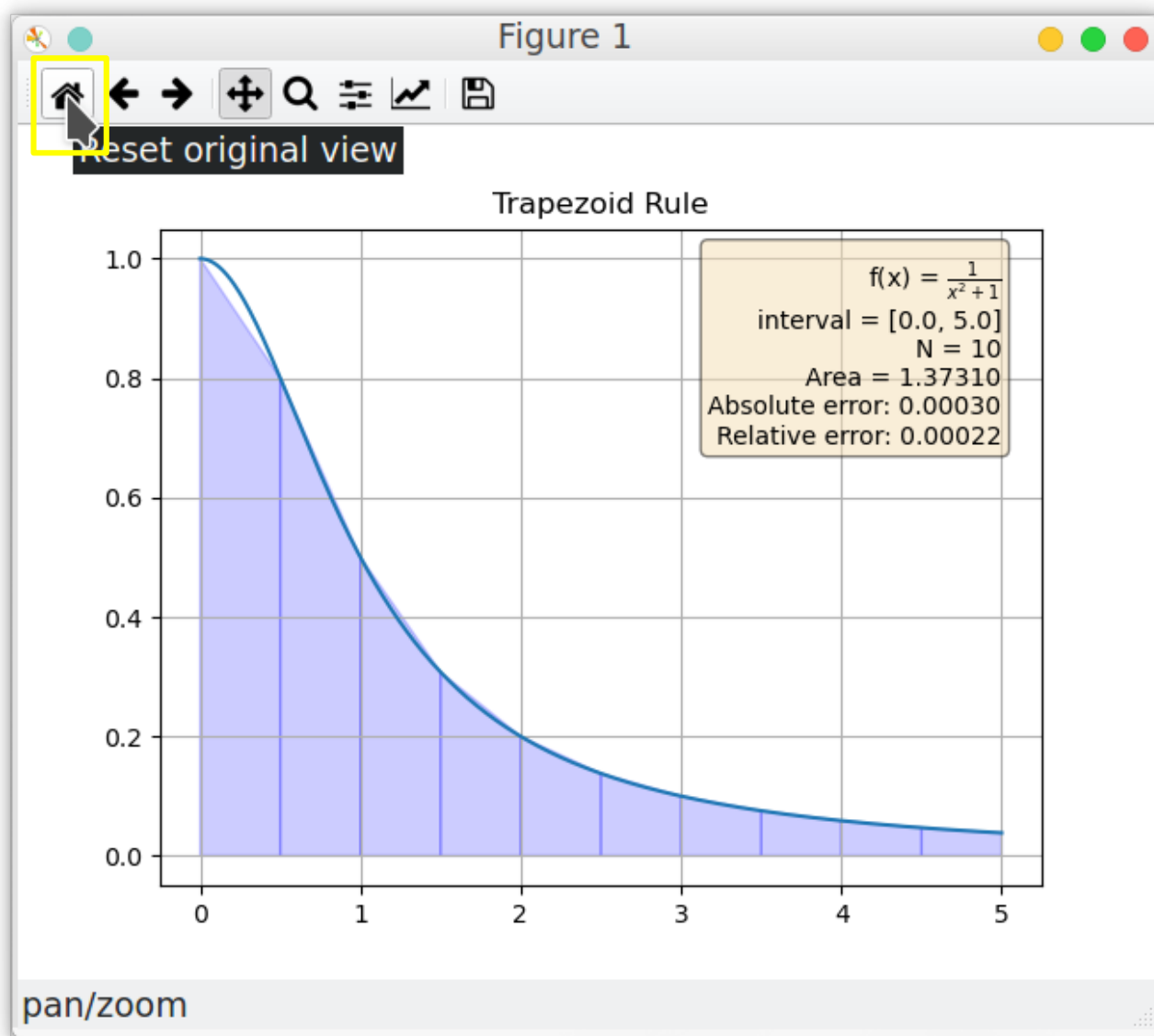


Figure 5: Button to reset to original view



The second button allows you to go back to the last change made (figure 5).

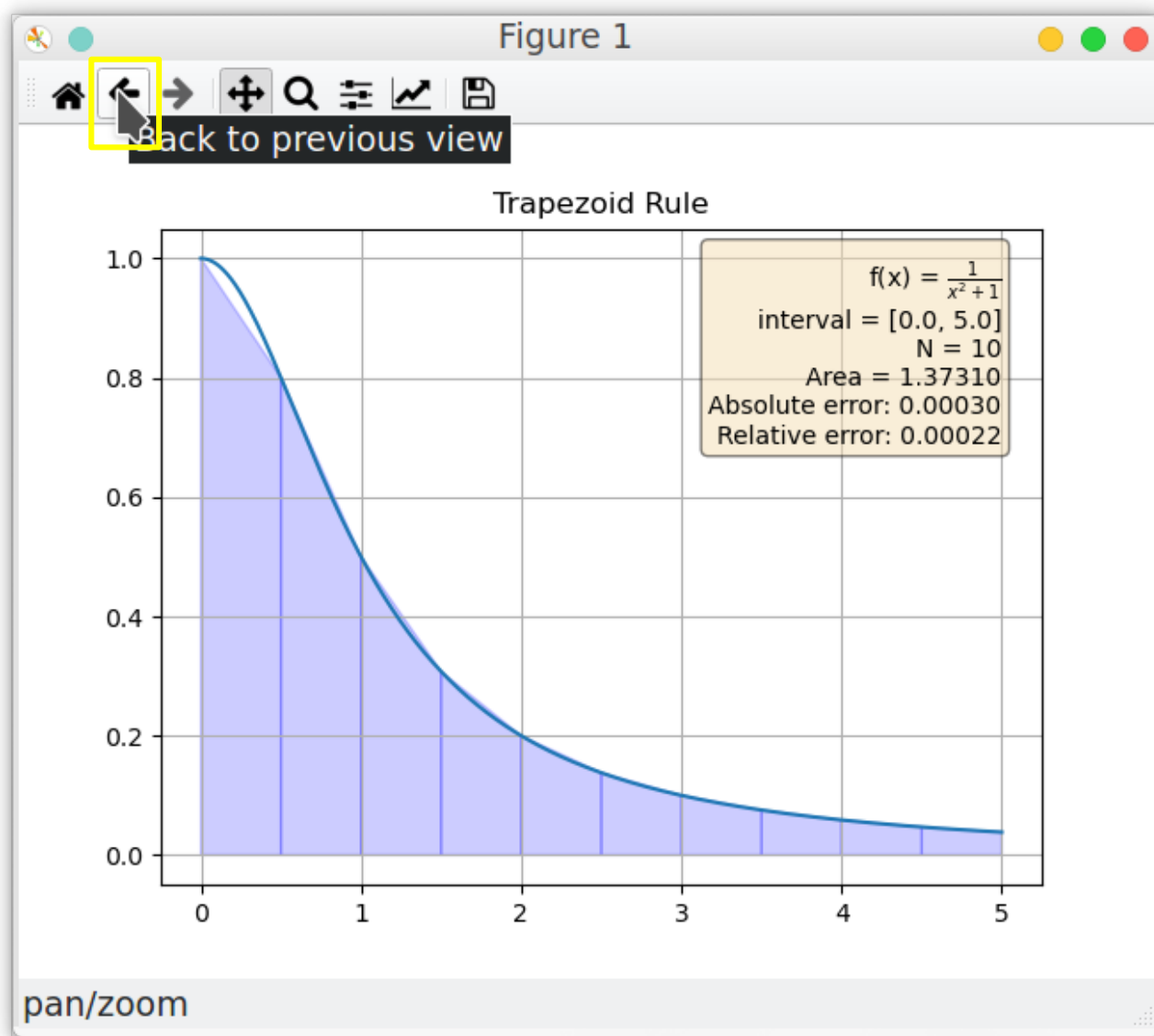


Figure 6: Button to go back to the last change



The third button allows you to undo the last change made (figure 6).

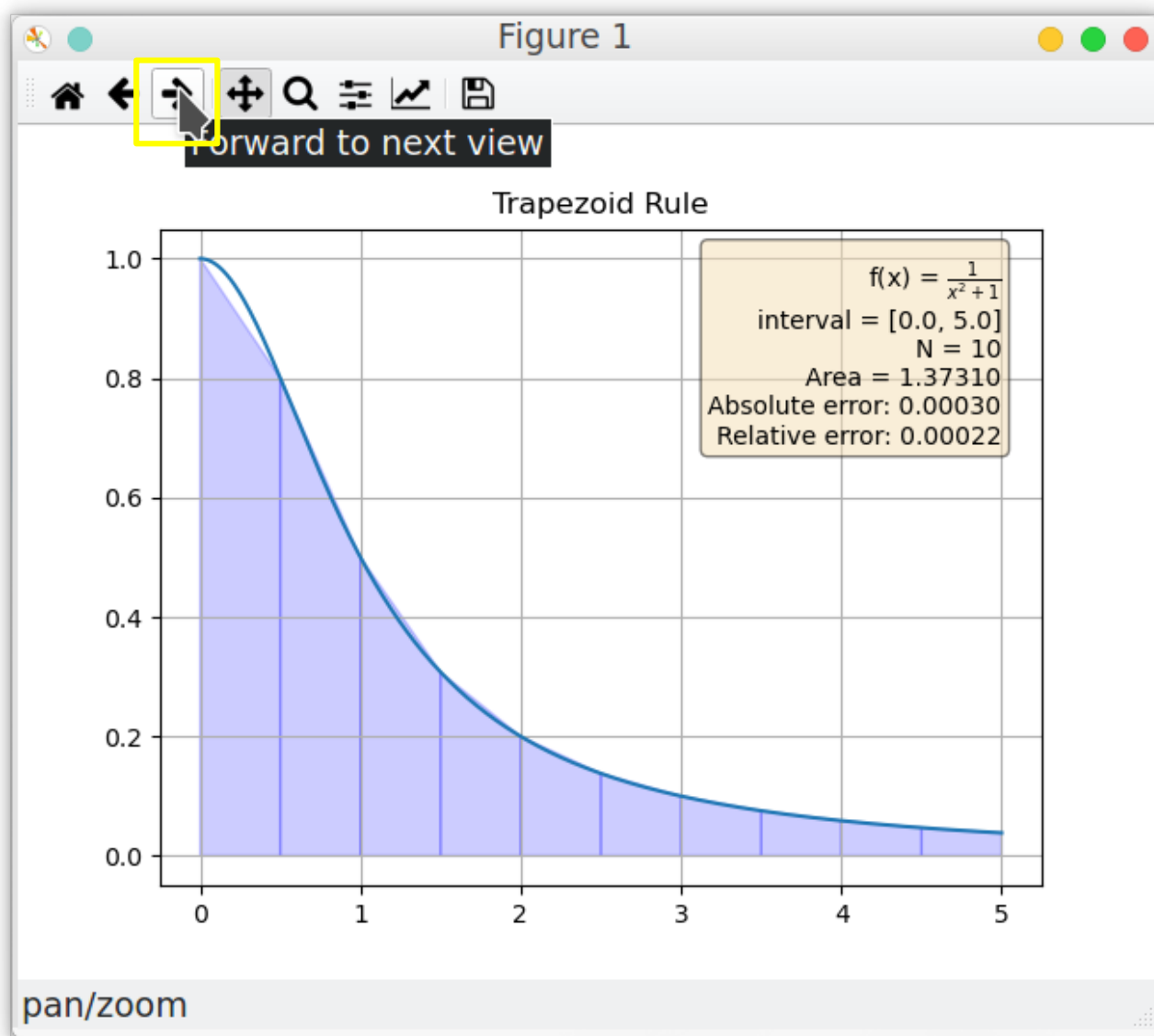


Figure 7: Button allows you to undo the last change made



The fourth button allows you to move on the graph with the help of the mouse (figure 7).

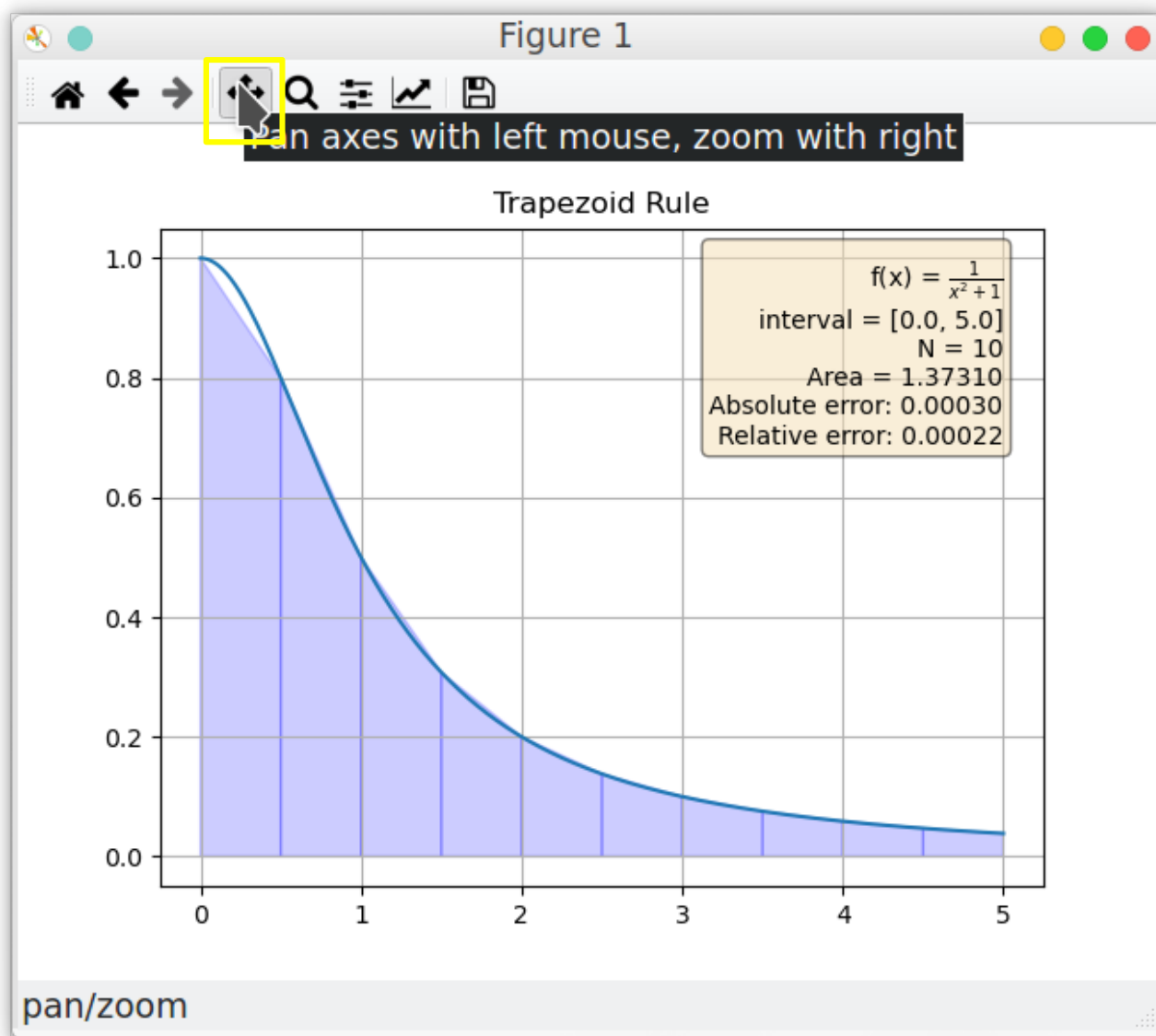


Figure 8: Button that allows scrolling in the graph with the mouse





The fifth button is to zoom (figure 8).

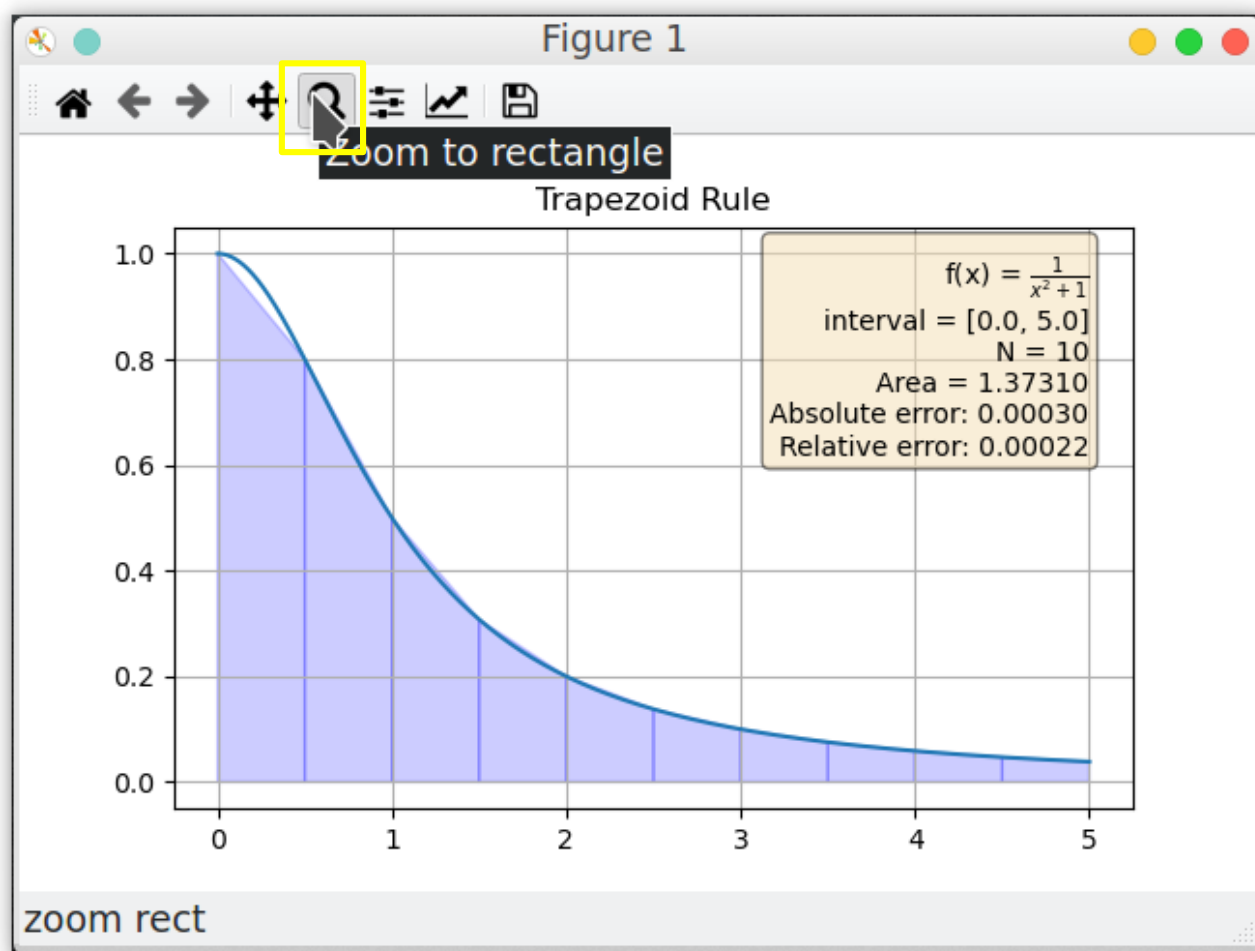


Figure 9: Zoom button



The sixth button allows you to configure extra options such as borders and spacings (figure 9).

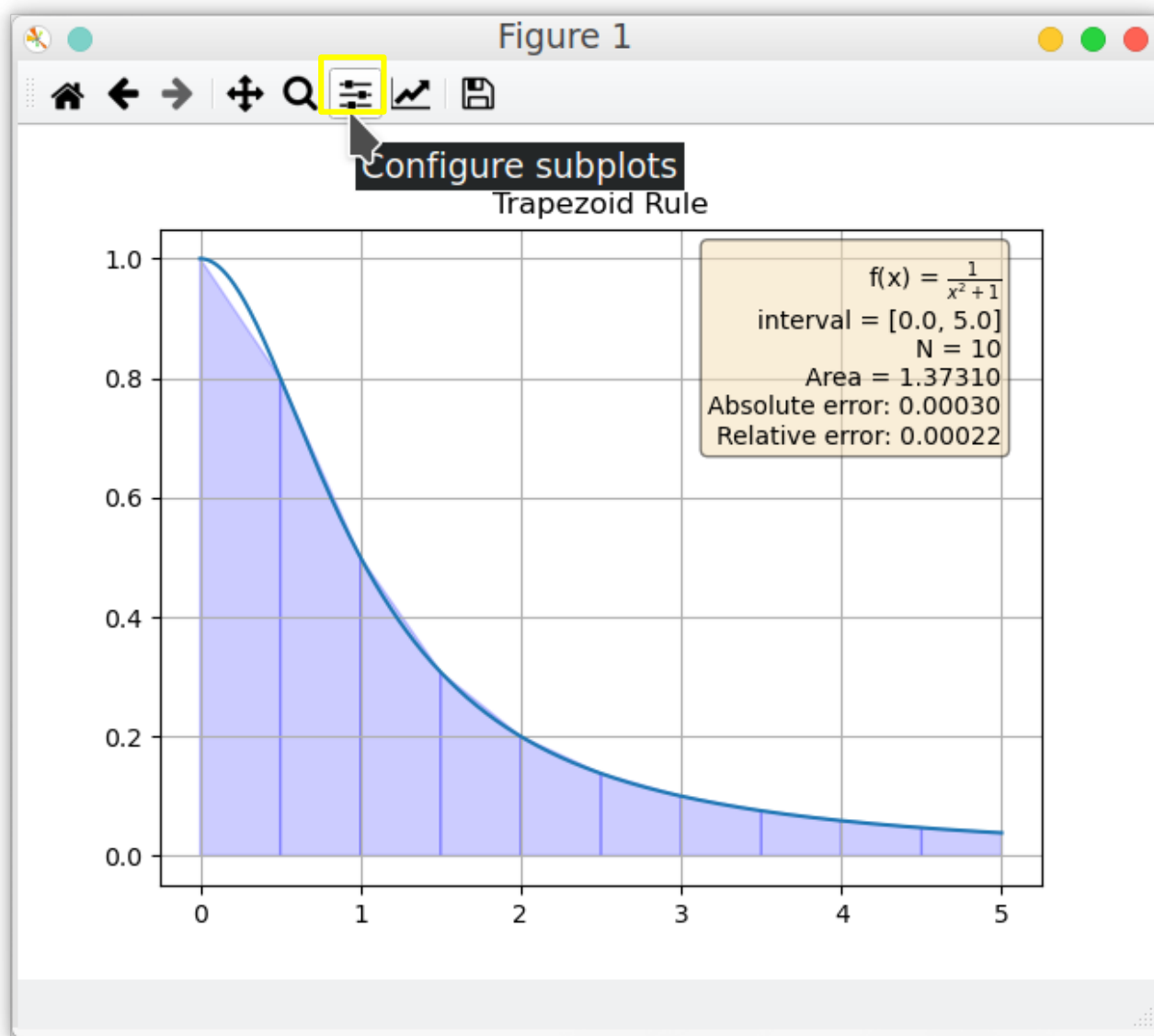
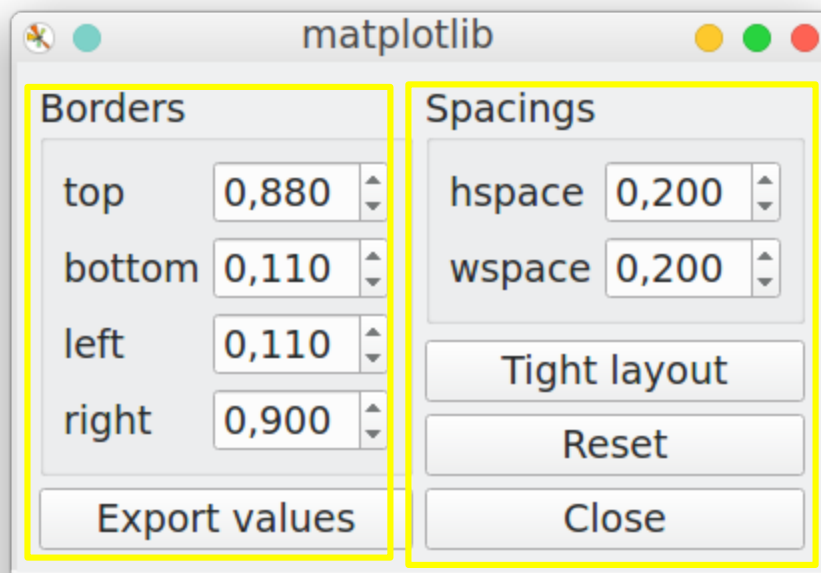


Figure 10: Button that allows configuring the subplots

A pop-up window will appear from the button (figure 10):



*Figure 11: Pop-up window for subplots configuration*

A pop-up window will appear from the button (figure 10). There are two major modifications: borders and spacings. At the borders you can modify the top, bottom, left, and right. At spacings, you can change the space.



The seventh button allows to modify the axis, the curve and the parameters for the image (figure 11).

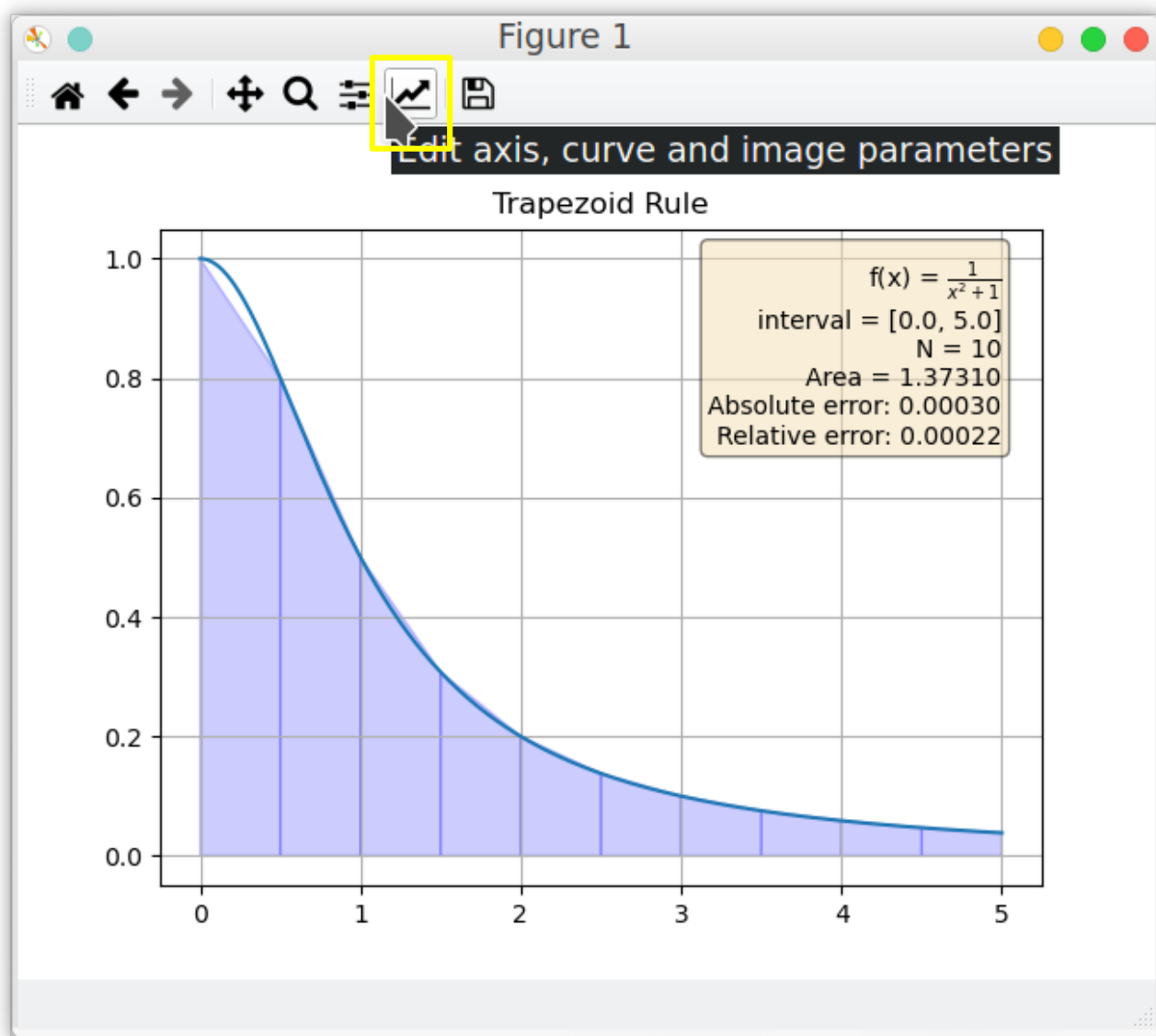


Figure 12: Button button to edit the axes, curve and image parameters

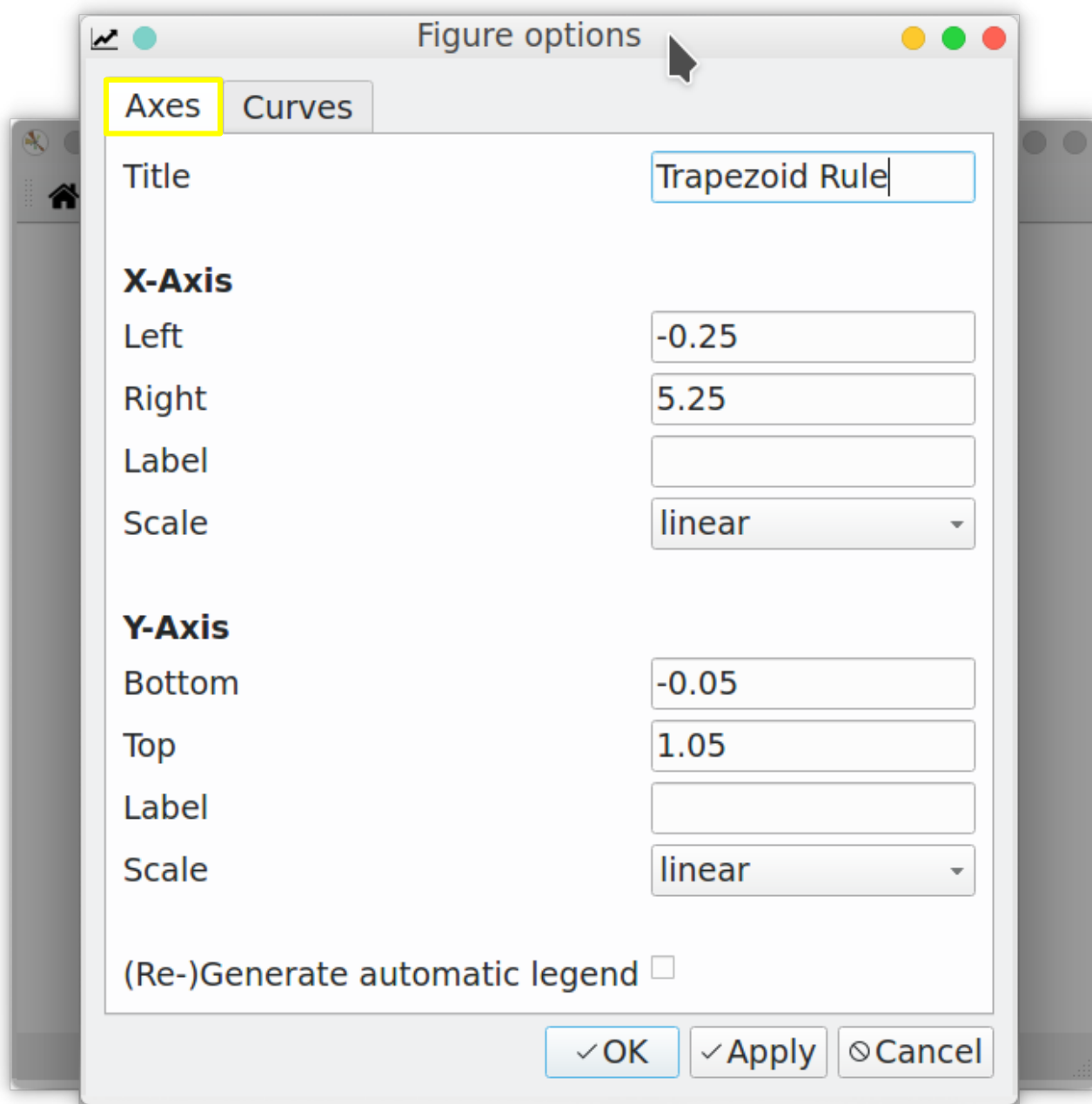


Figure 13: Pop-up window with option to configure axes

Then a pop-up window appears that allows you to modify the x and y exercise. (figure 12).

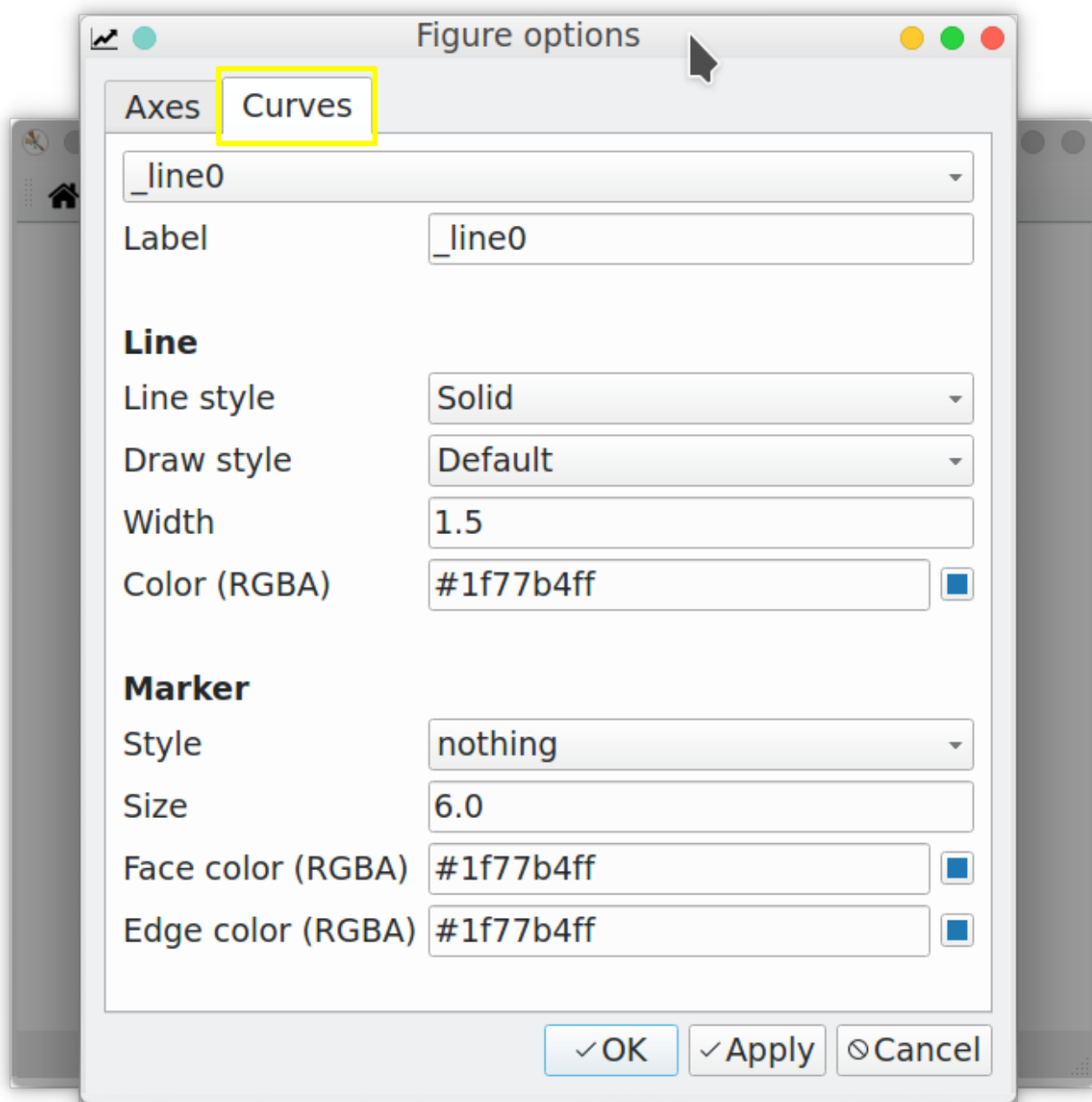


Figure 14: Pop-up window with option to configure the curves

In the same pop-up window there is a tab, where you can modify the curve on the graph (figure 13).

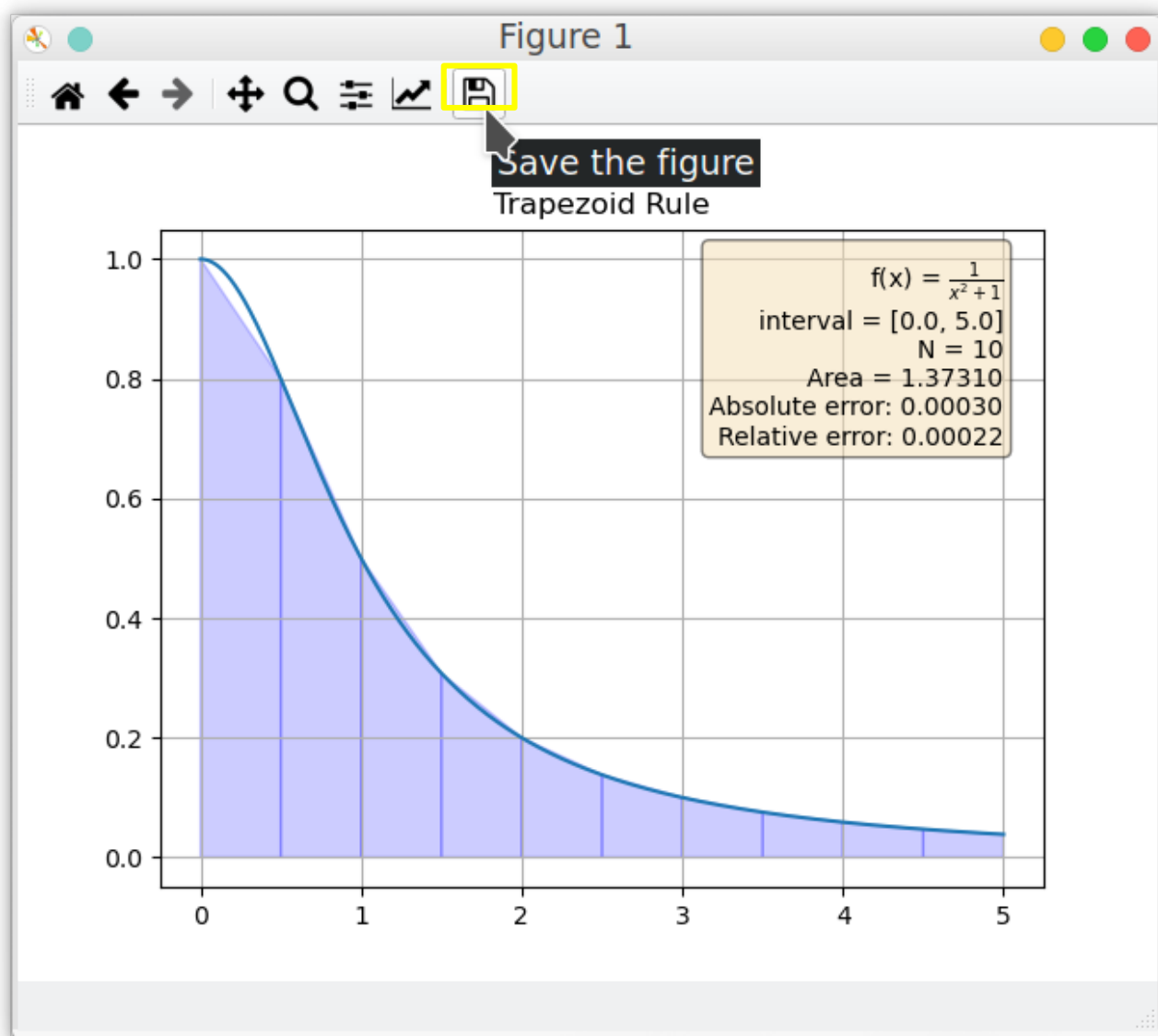


Figure 15: Button that allows saving the graph

The last button allows you to save the graph (figure 14).



Returning to the main pop-up window, there is a second button that is about, which is in charge of showing the information and references of the program (figure 15).

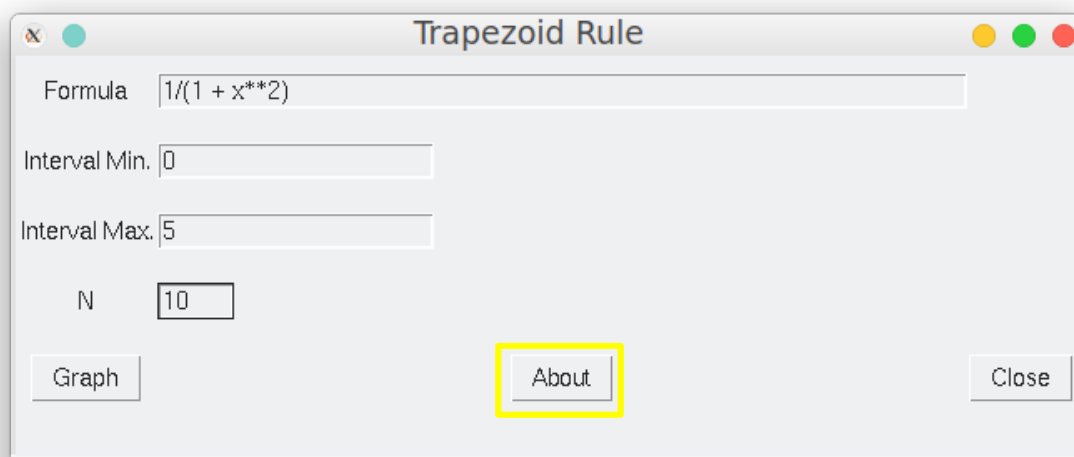


Figure 16: Going back to the main pop-up window





Information such as the name of the project, version, date of completion, author, email, company, university, faculty, subject and teacher will appear (figure 16).



Figure 17: About pop-up



Returning to the main pop-up window, the last button allows you to close the pop-up window (figure 17).



Figure 18: Going back to the main pop-up window