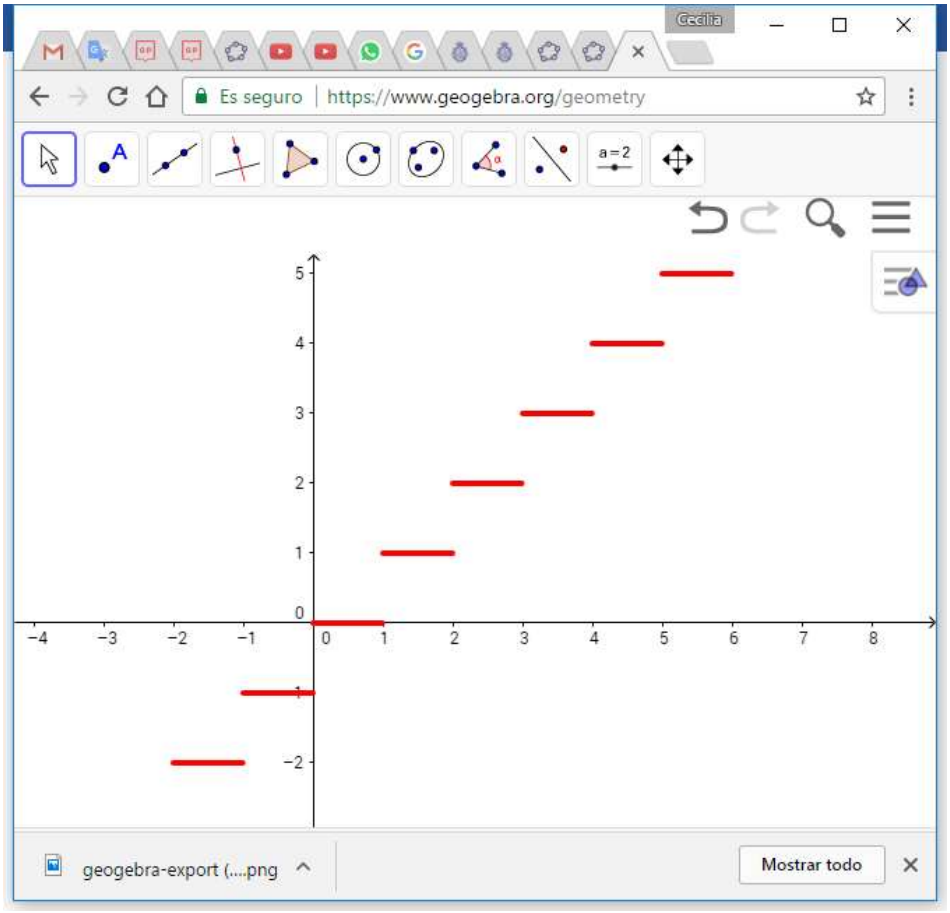
FLOOR FUNCTION



FLOOR FUNCTION

Didactic purposes:

Understand the behavior of the floor function by analyzing the graph obtained in GeoGebra.

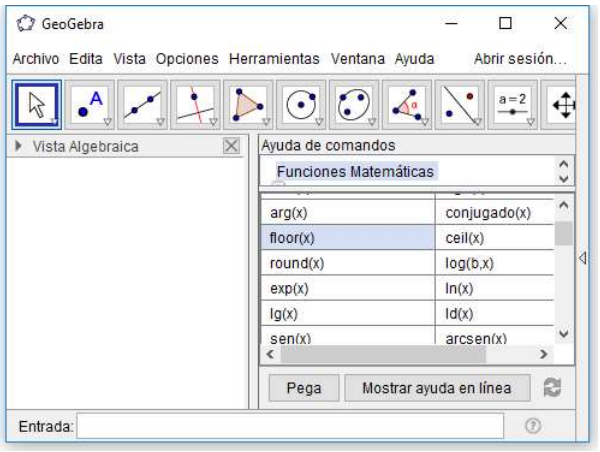
Analyze the behavior of ***a floor(b x) + c*** from a dynamic graph obtained in GG using the sliders ***a, b, c***.

Use the model for determinate ***a, b, c*** in a particular problem.

Definition: The function ***floor(x)*** assigns to each real number ***x*** the largest integer less than or equal to ***x***.

Notation: ***f(x)=[x]***

In GeoGebra:



Activity 1.

In the **Input Bar** it can:

-Write ***floor(x)*** and press Enter.

-Select **Input Help-Mathematical Functions-** ***floor(x)*** and double click or click on the button Paste.

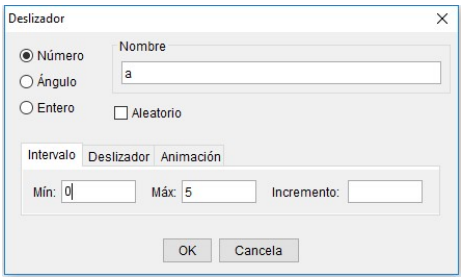
The graph of the function is obtained.

This activity consist in analyze the graph for consistency with the definition. Determine the domain and the image.

Activity 2.

In a new window of GeoGebra:

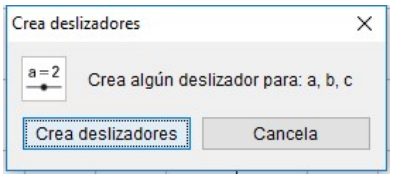
a) Define three sliders with values between 0 and 5.



Press OK and repeat two more times for obtain three sliders : ***a, b, c.***

In the **Input Bar** write ***a floor(b x)*** + ***c*** and press Enter.

Comment: if you write directly this function without previously defining the sliders, GG will ask if **a, b, c** are sliders and will create them, the default range will be **-5 to 5.**



Use the sliders to analyze the effect of each parameter on the steps.

Activity 3.

Determine the values of **a, b, c** to obtain a function to modelling the cost of a taxi trip based on the number of traveled blocks. Assume the following conditions:

-The travel unit is “block” (100 meters)

-The fixed cost of start is $23,20.

-The cost of two blocks travelled is $2,32.

- No cost is considered for waiting time.

With these values of **a, b, c,** write the function ***f (x) = a floor (b x) + c*** in the **Input Bar** of a **new GG window**. To calculate the cost of **10 blocks** trip, write in the Input Bar **f (10)** and press Enter.

Calculate the cost of 2,5 km trip.

Calculate the cost of 1823 meters trip.