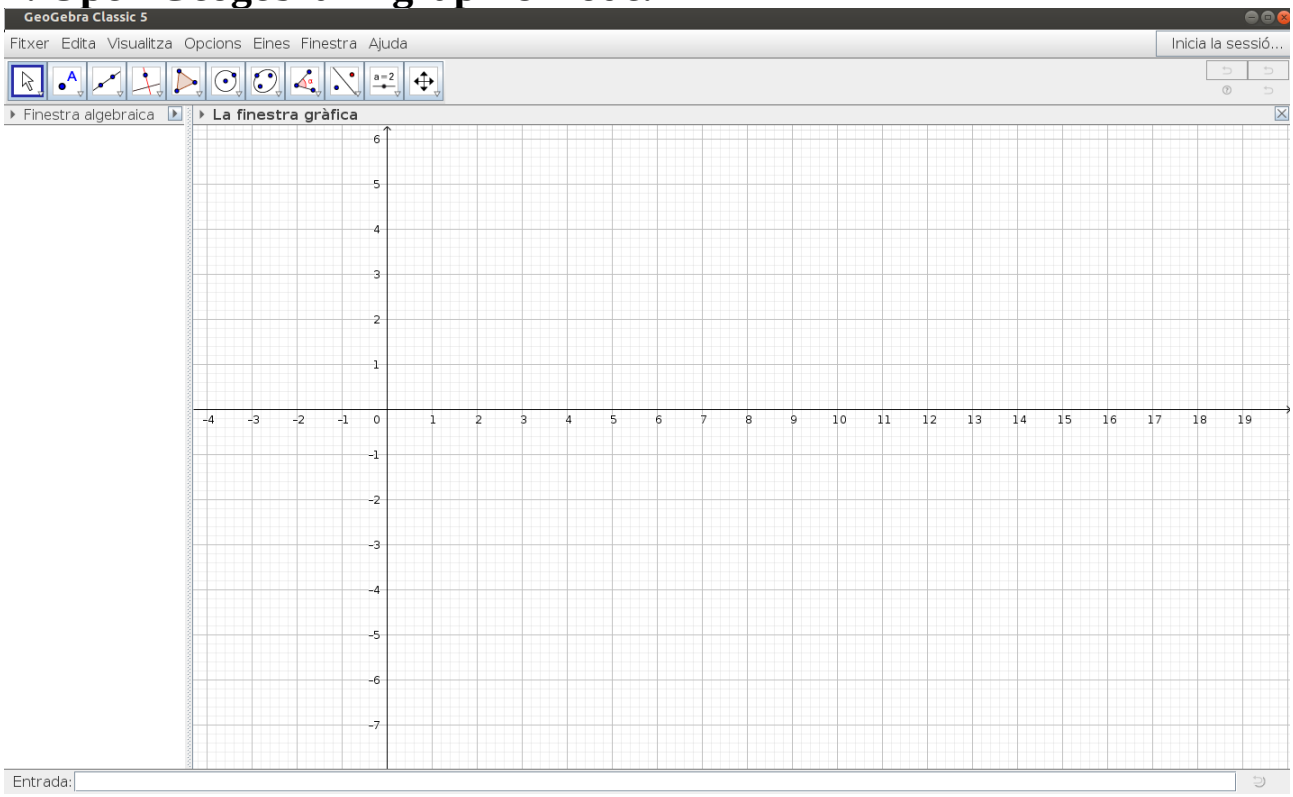
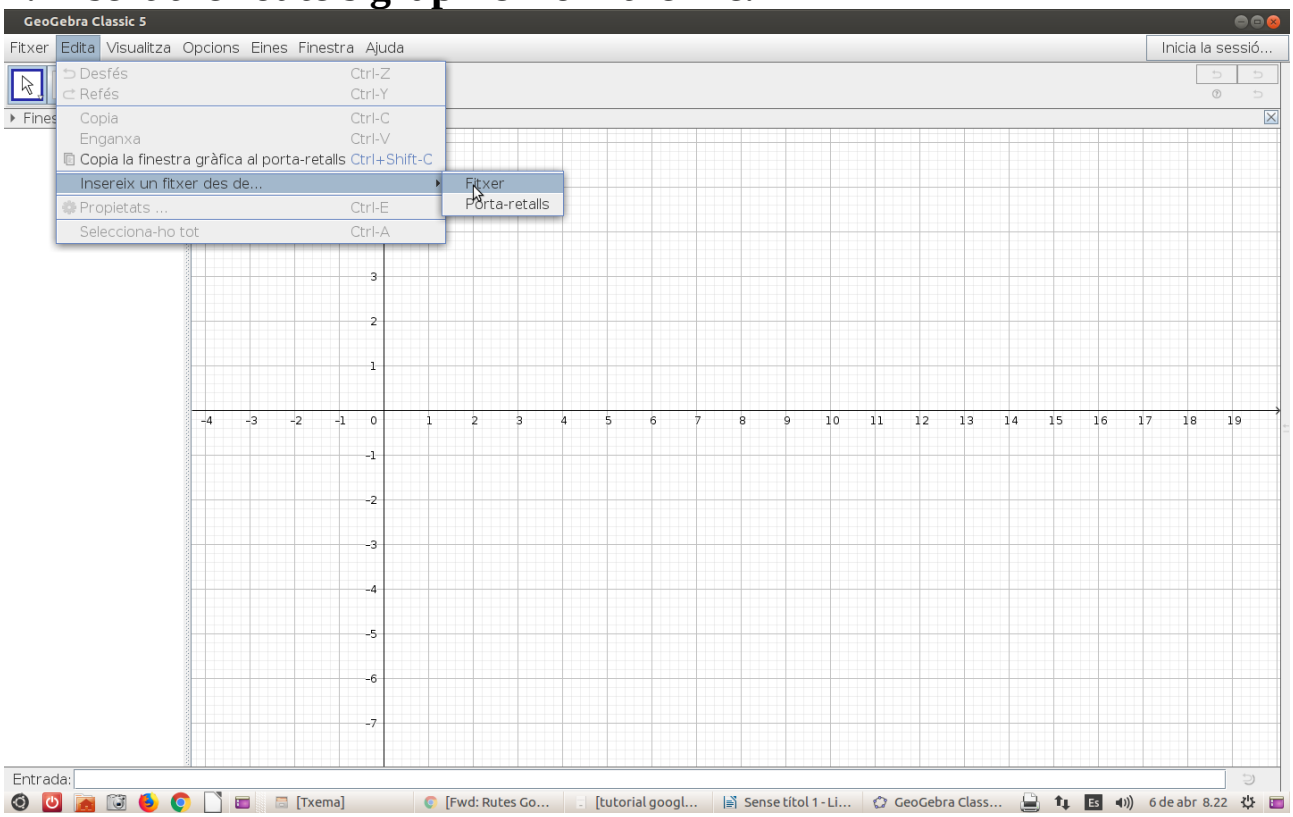
Studying the route's sloop with Geogebra

1. Open Geogebra in graphic mode.

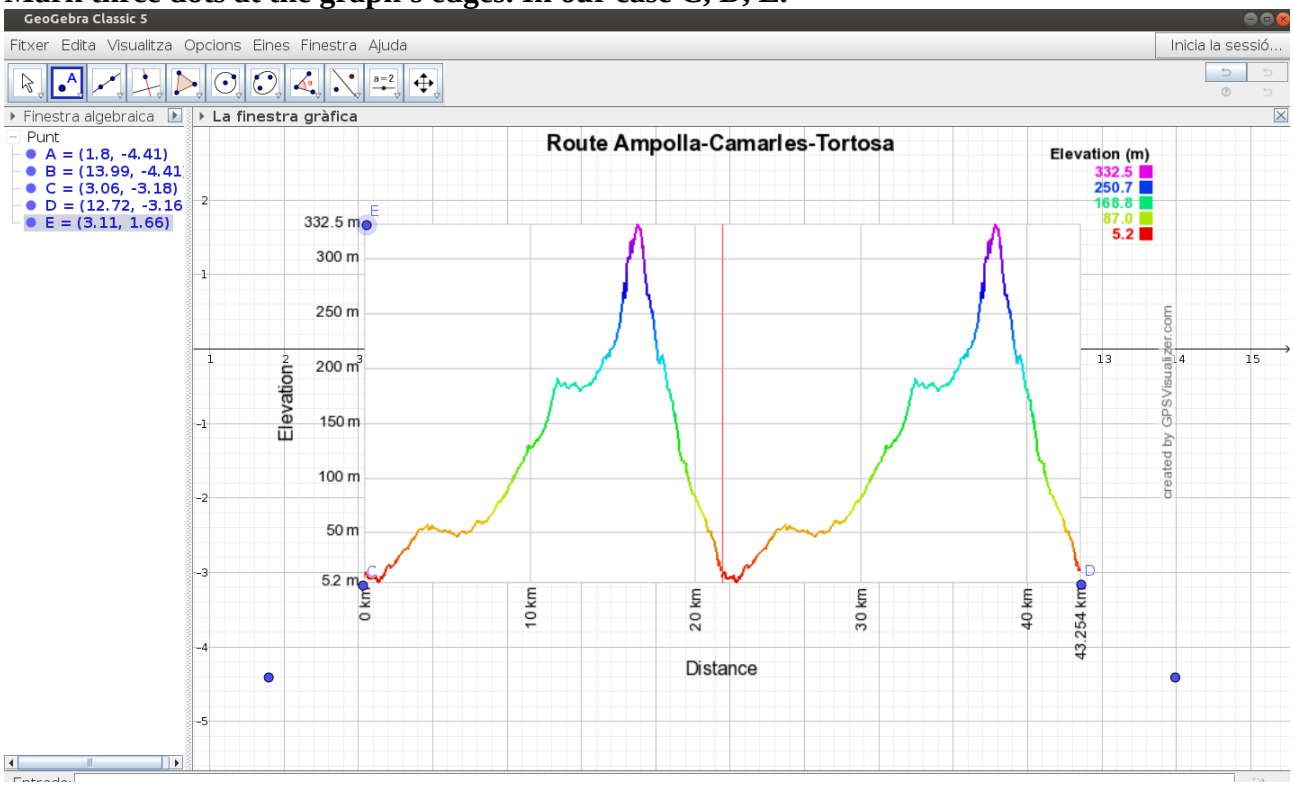


2. Insert the route's graphic from the file.

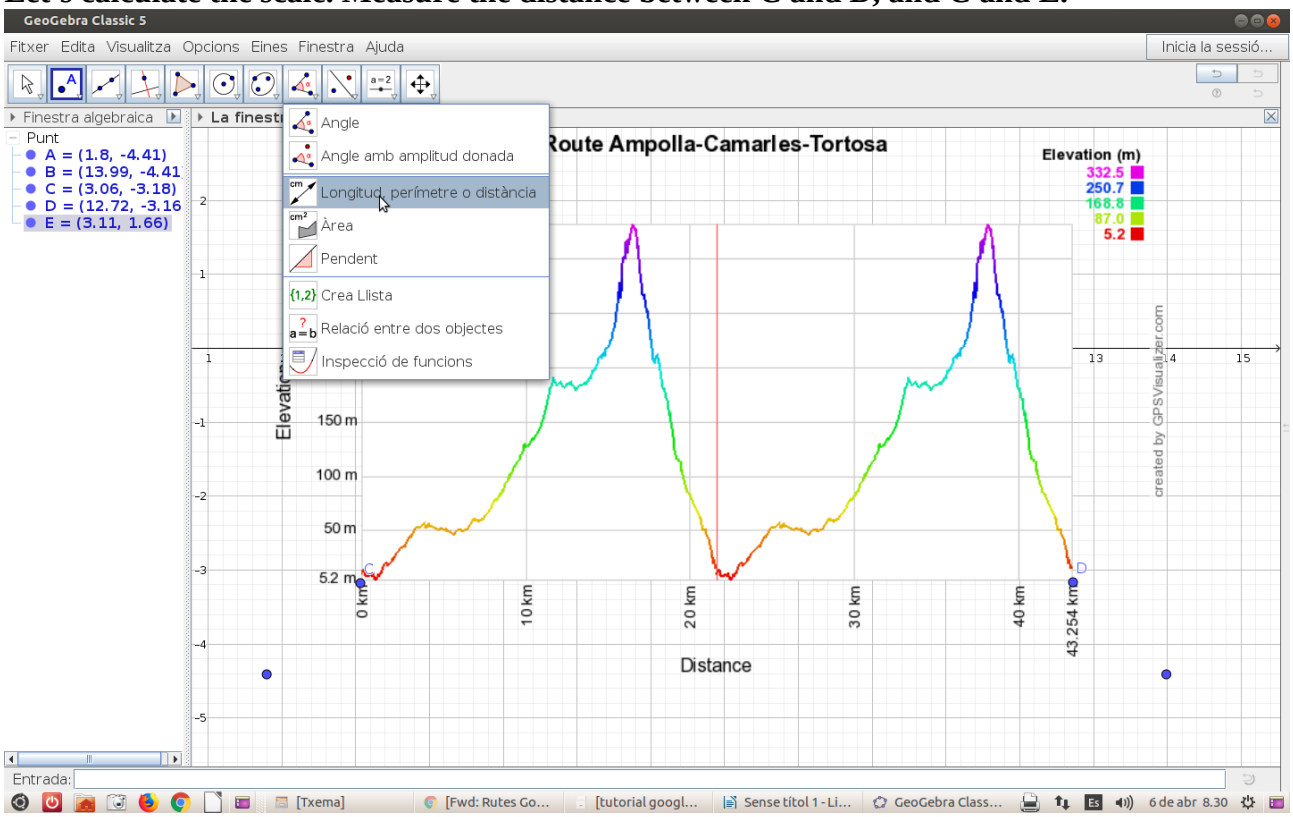


3. Defining dots to calculate the scale of the image

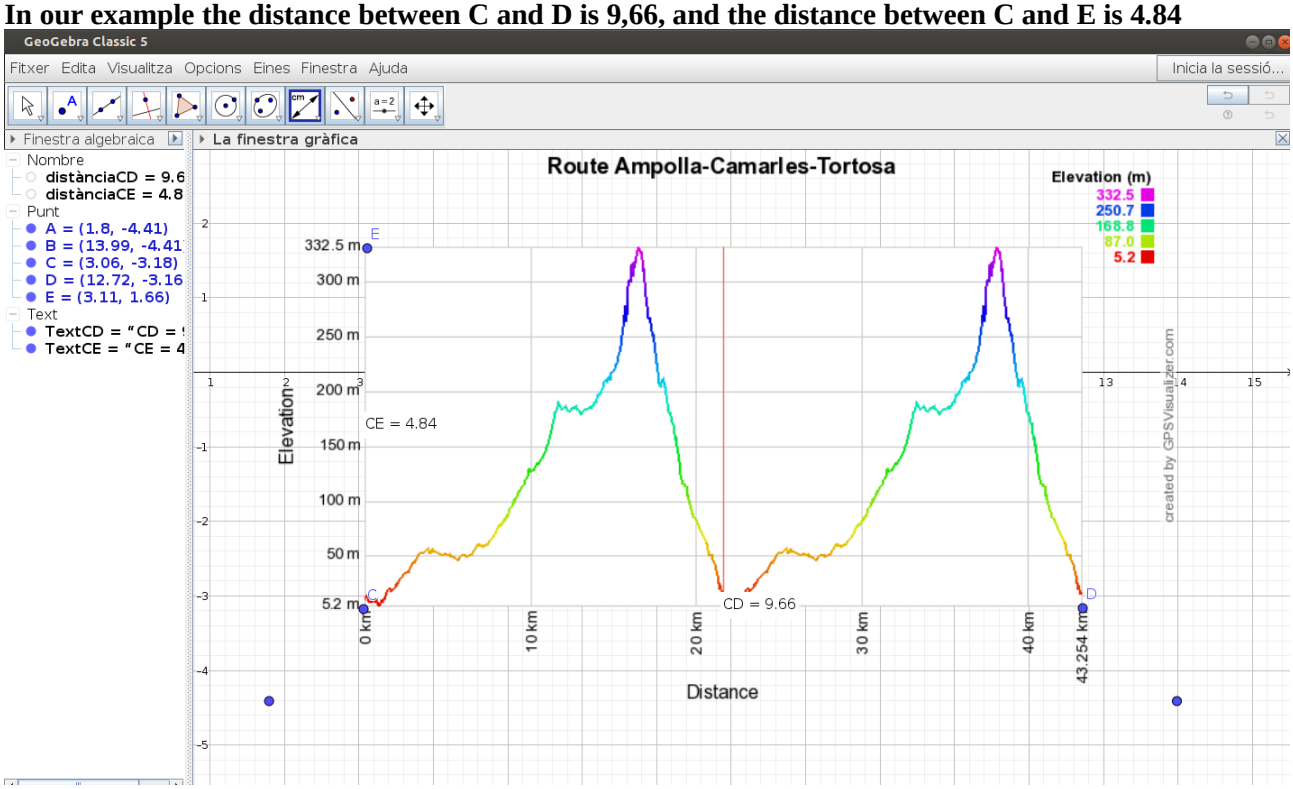
Mark three dots at the graph's edges. In our case C, D, E.



Let's calculate the scale. Measure the distance between C and D, and C and E.



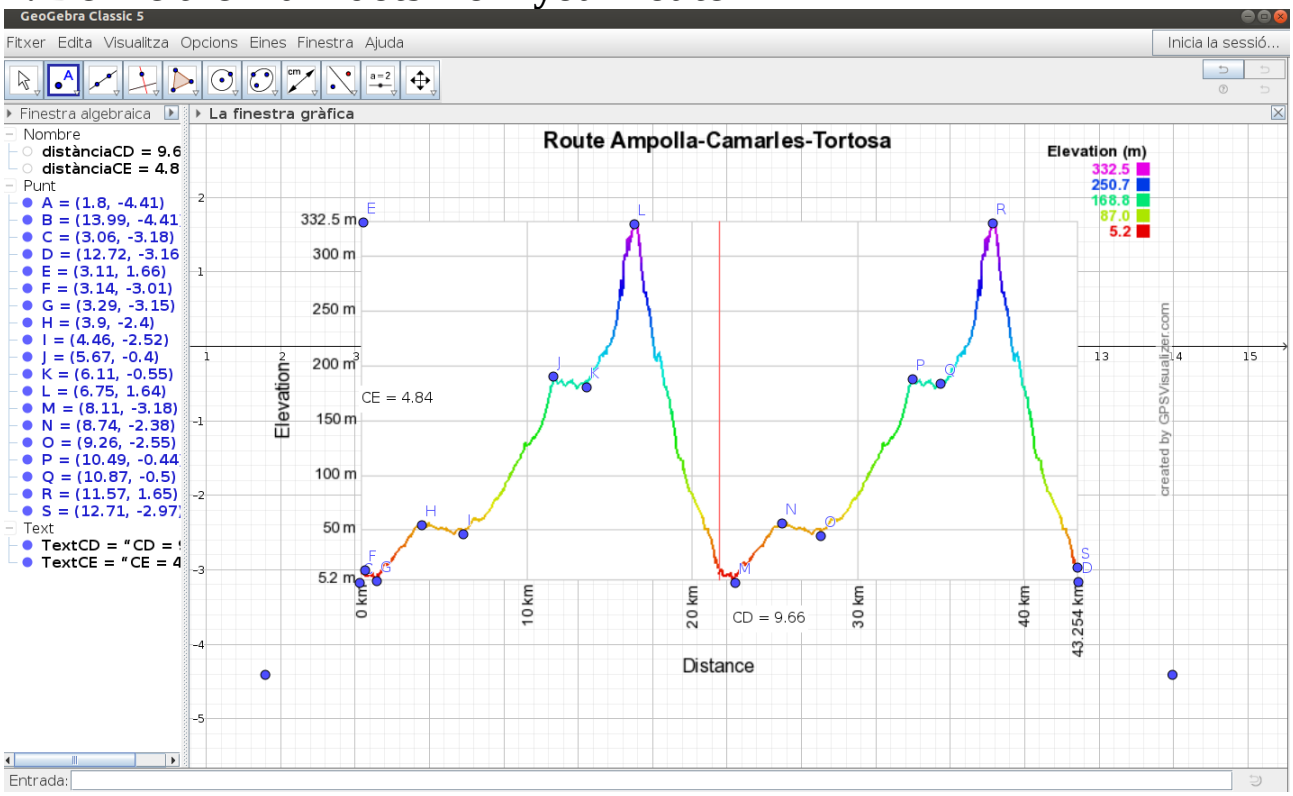
In our example the distance between C and D is 9,66, and the distance between C and E is 4.84



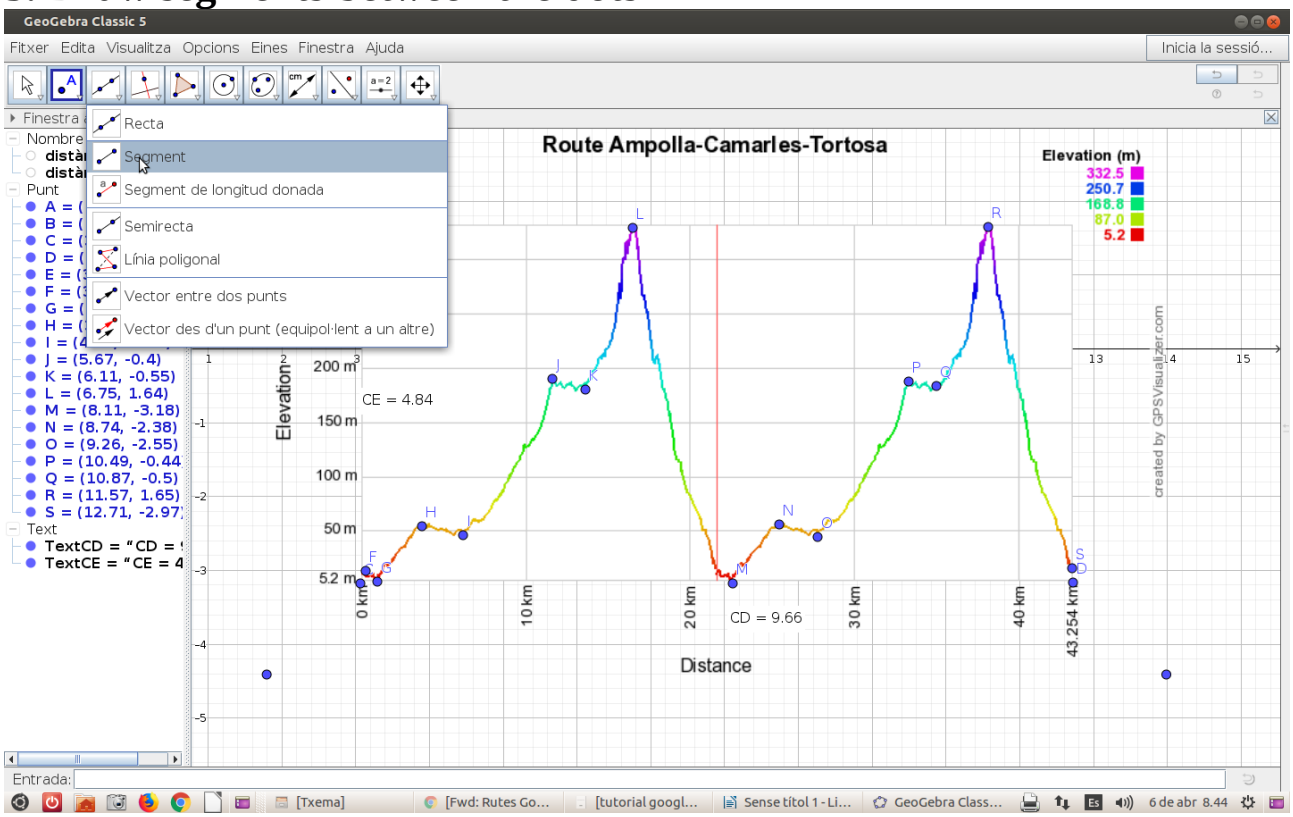
To calculate the scale in each axis, divide the real data and the distance measured with Geogebra.

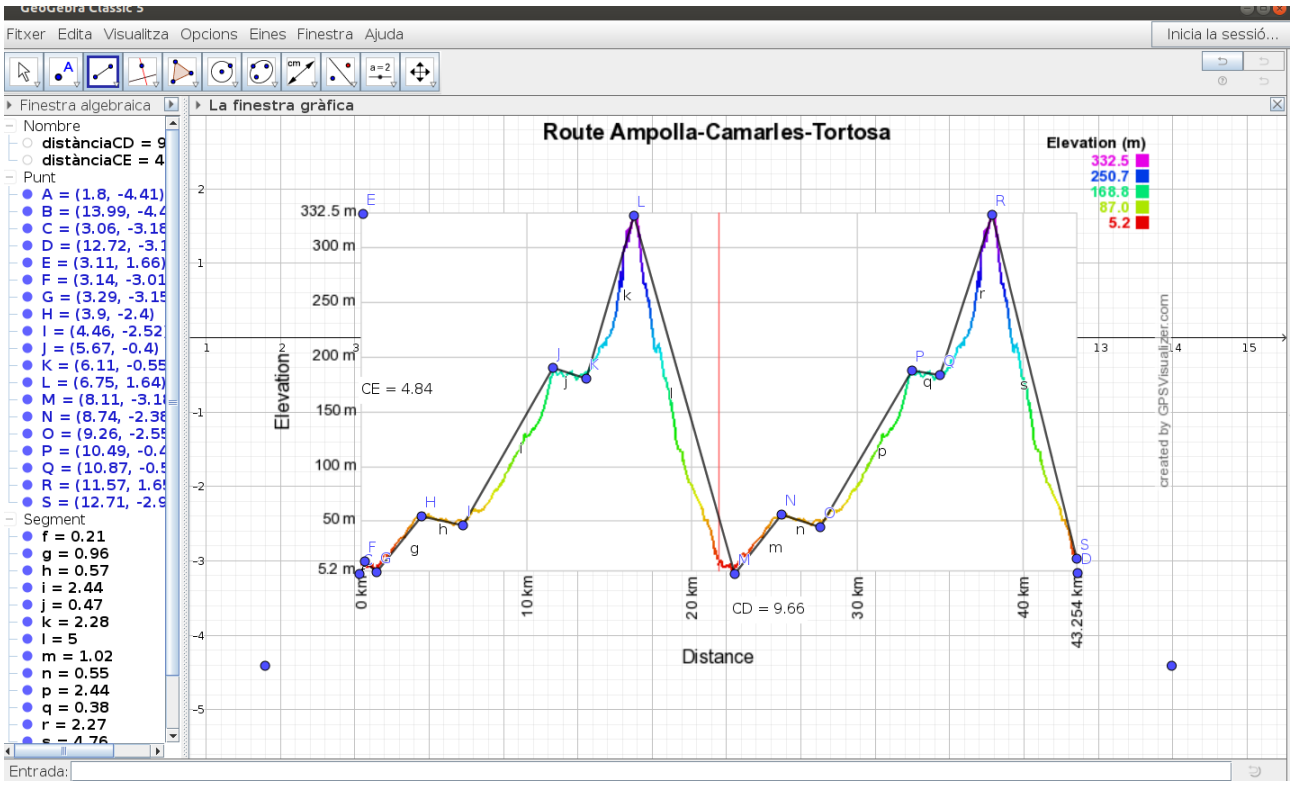
Scale Axis X $\frac{43254}{9.66} = 4477{,}64$ **Scale Axis Y** $\frac{332{,}5 - 5{,}2}{4{,}84} = 67.62$

4. Define the main dots from your route

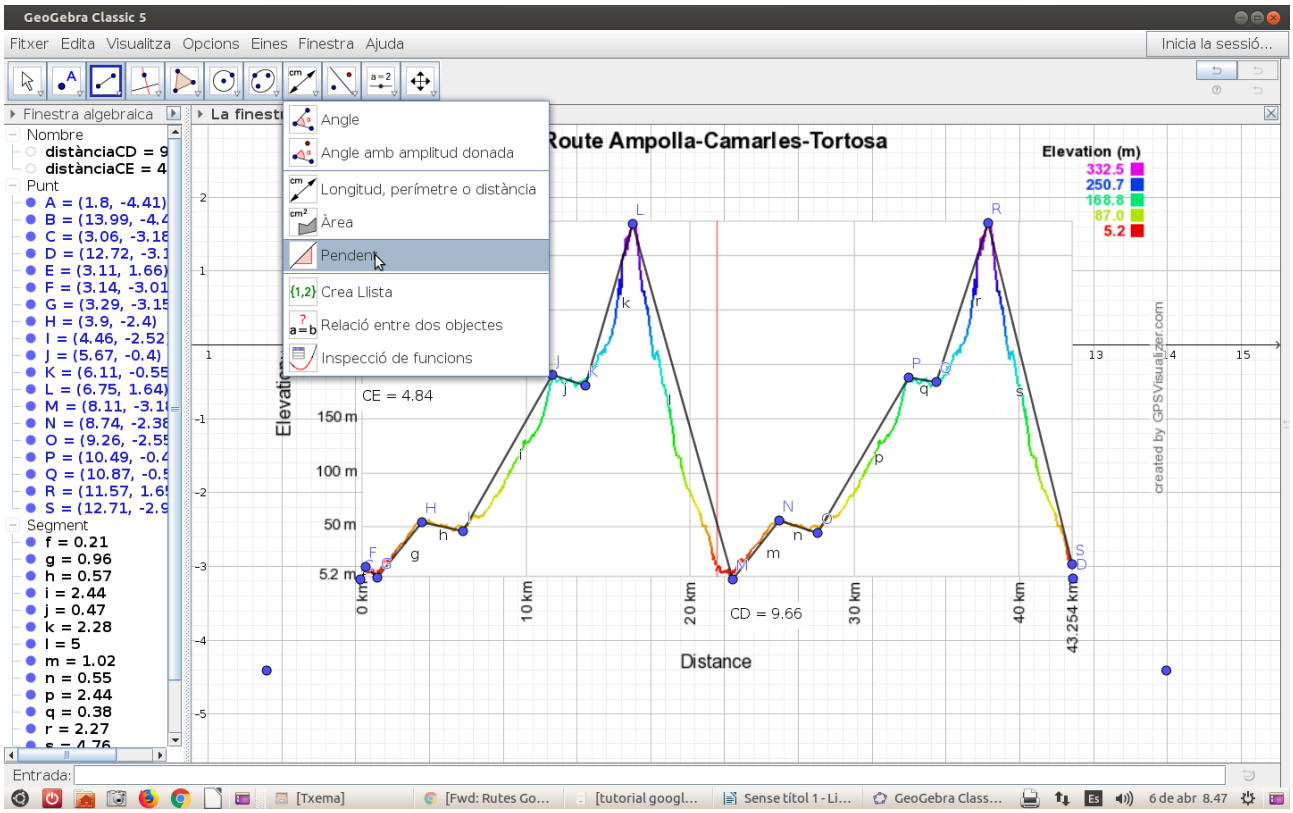


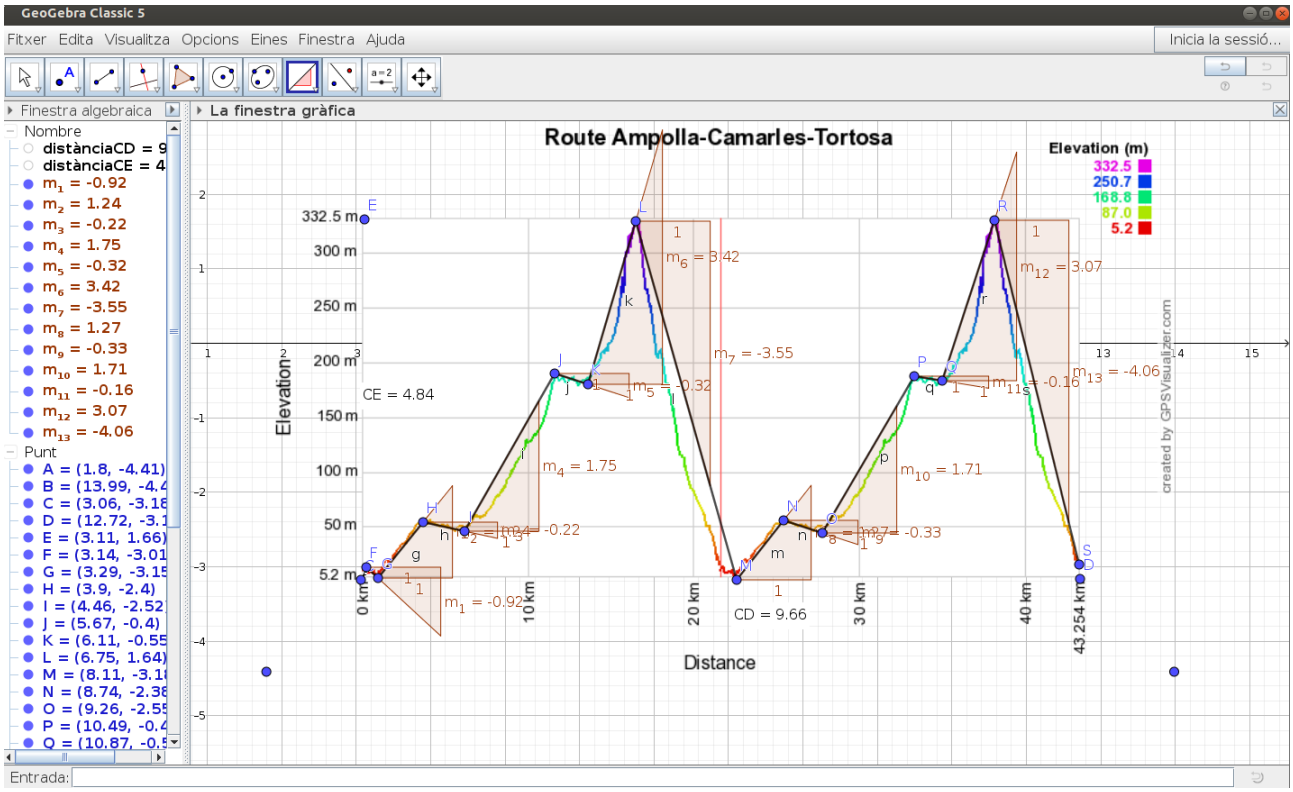
5. Draw segments between the dots





6. Calculating the sloop of the different segments.





Now, we have to convert the Geogebra's sloop into the real one. We will use the scales from above. Apply the following formula

$$real\ sloop = Geogebra's\ sloop * \frac{Scale\ Y}{Scale\ X} * 100\,\%$$

For example m_{12}=3,07

$$real\ sloop = \frac{3{,}07 * 67{,}62}{4477{,}64} * 100\,\% = 4.64\,\%$$

Do the same with all the segments.