

Math project

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Geogebra

Miryea Ruiz & Quincy Ladry

class 5VB

Our picture:



Window in “La Sagrada Familia”

Introduction

For our math project we had to make a report using a programme called Geogebra. Our aim was that we needed to have a picture with different shapes, so that we could use that to treat it in the programme. Finally we had decided what our picture was going to be and so we began on our project. Our report contains the following parts:

- The Building
- Description of the picture
- Steps
- Conclusion

The building

The picture that we have chosen belongs to a famous church called La Sagrada Familia. This church was founded in Barcelona. That is also why we have chosen this picture. We both went on a week of excursion in October 2008.

The church has been in reconstruction since 1882. During and after the civil war in Spain nobody worked on the church. The release date should officially have been in 2026, but everybody thinks that the work will never be completed. The reconstruction is taken so long that parts that are completed must be renovated because they already have been affected.

Joseph Maria Bocabella came on the idea. He thought it would be a good chance on the contrary for the Roman Catholic, but also especially to protect Sint Josef against the unchristianing (ontkersting). The task was eventually given to Gaudí. He has put all his architecture and beliefs in the project. La Sagrada Familia is then also the masterpiece of Gaudí.



Description of the picture



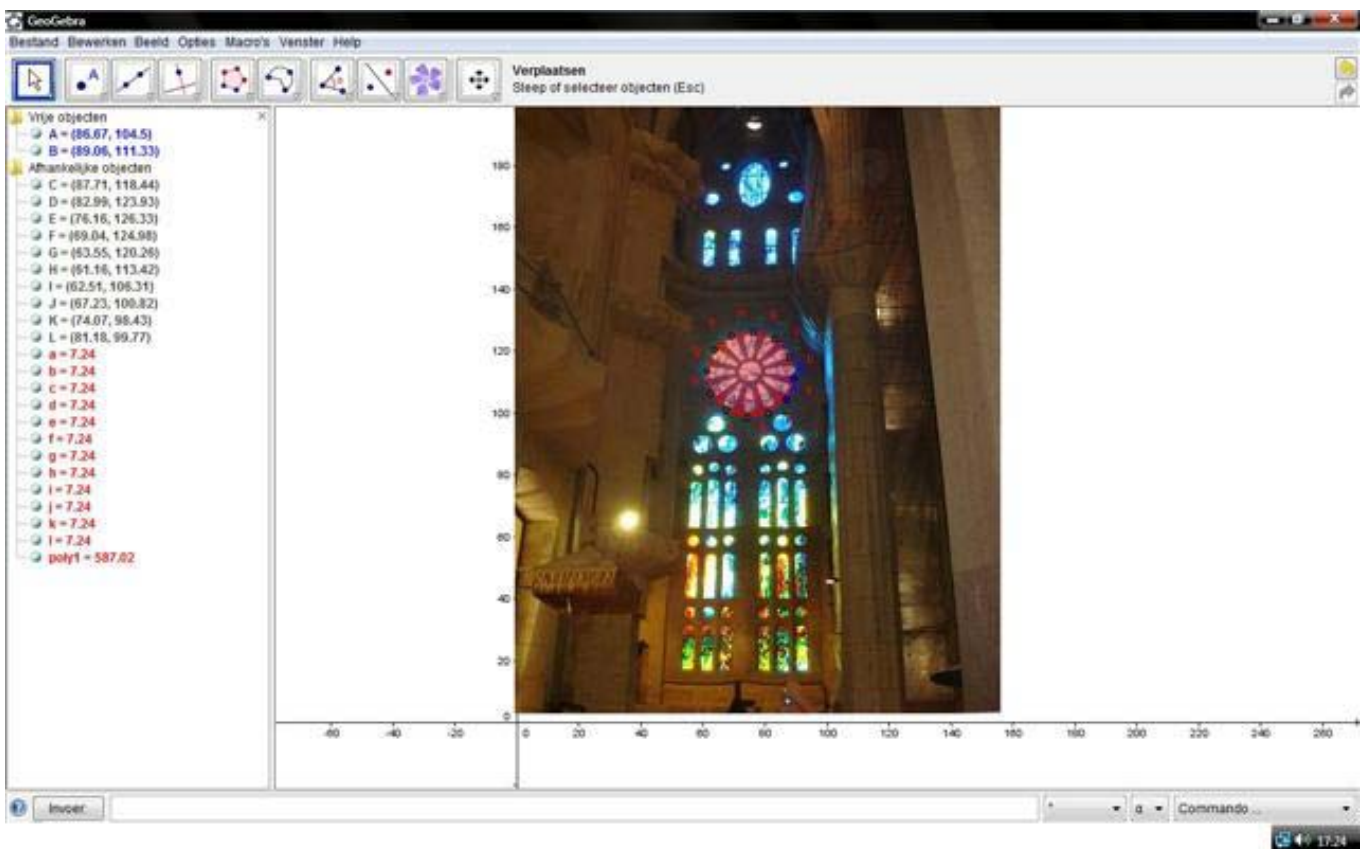
We took the window of “La Sagrada Familia” as our picture. As you can see there are a lot of shapes in it. These forms are especially round. You can see that these forms are connected to each other and there trying to image figures. For example the flower on the left that can find inside of the window



These forms also give a gracefull atmosphere. This is due to the accurate patern they used. What also helps is that the full image of the window had been symmetric determined. If you could split the image you would see that both sides have the same picture.

Steps

Our first step to put in process was the most conspicuously figure of the image. The flower. The flower has the shape of a giant circle. That is also the figure that we used.

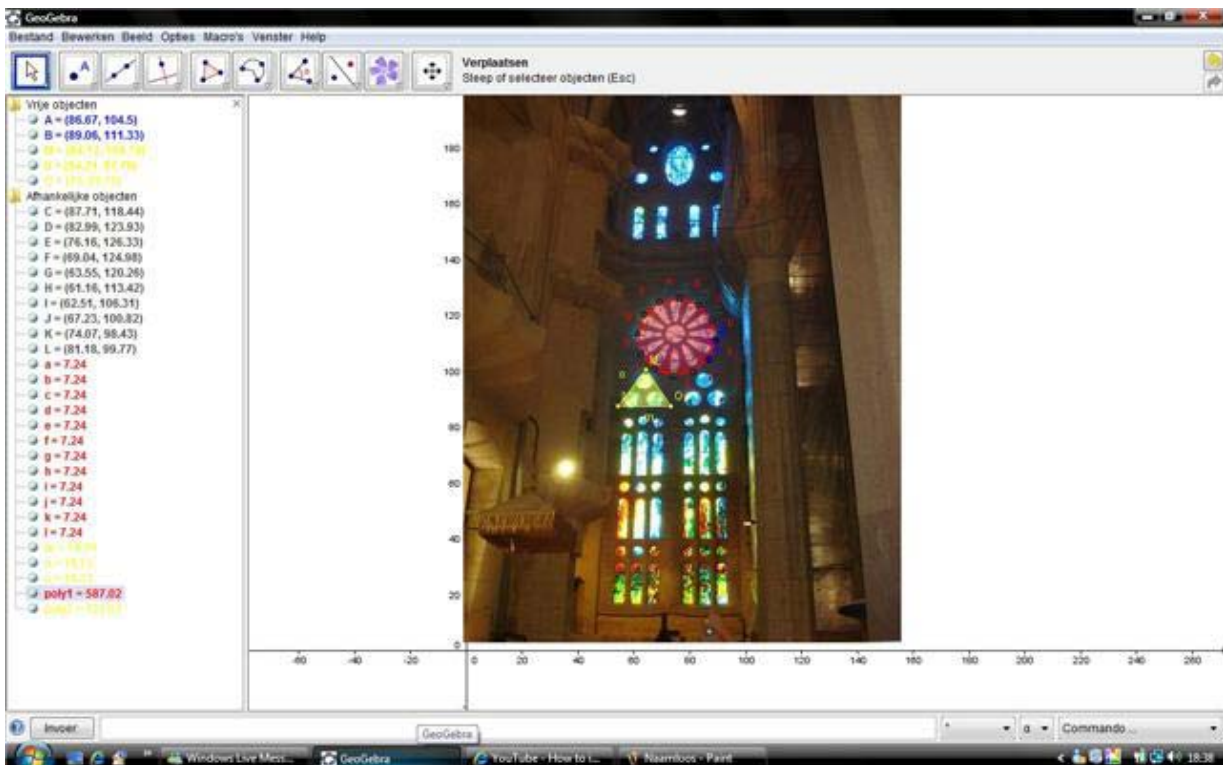


From this came the next data:

A = (86.67, 104.5)	a = 7.24
B = (89.06, 111.33)	b = 7.24
C = (87.71, 118.44)	c = 7.24
D = (82.99, 123.93)	d = 7.24
E = (76.16, 126.33)	e = 7.24
F = (69.04, 124.98)	f = 7.24
G = (63.55, 120.26)	g = 7.24
H = (61.16, 113.42)	h = 7.24
I = (62.51, 106.31)	i = 7.24
J = (67.23, 100.82)	j = 7.24
K = (74.07, 98.43)	k = 7.24
L = (81.18, 99.77)	l = 7.24

From this came that **poly1 = 587.02**
This is the square measure of the red circle.

The next step was the yellow triangle. You can find this triangle by connecting the three little circles to each other. They are so stacked on each other that it seems like it is a triangle.



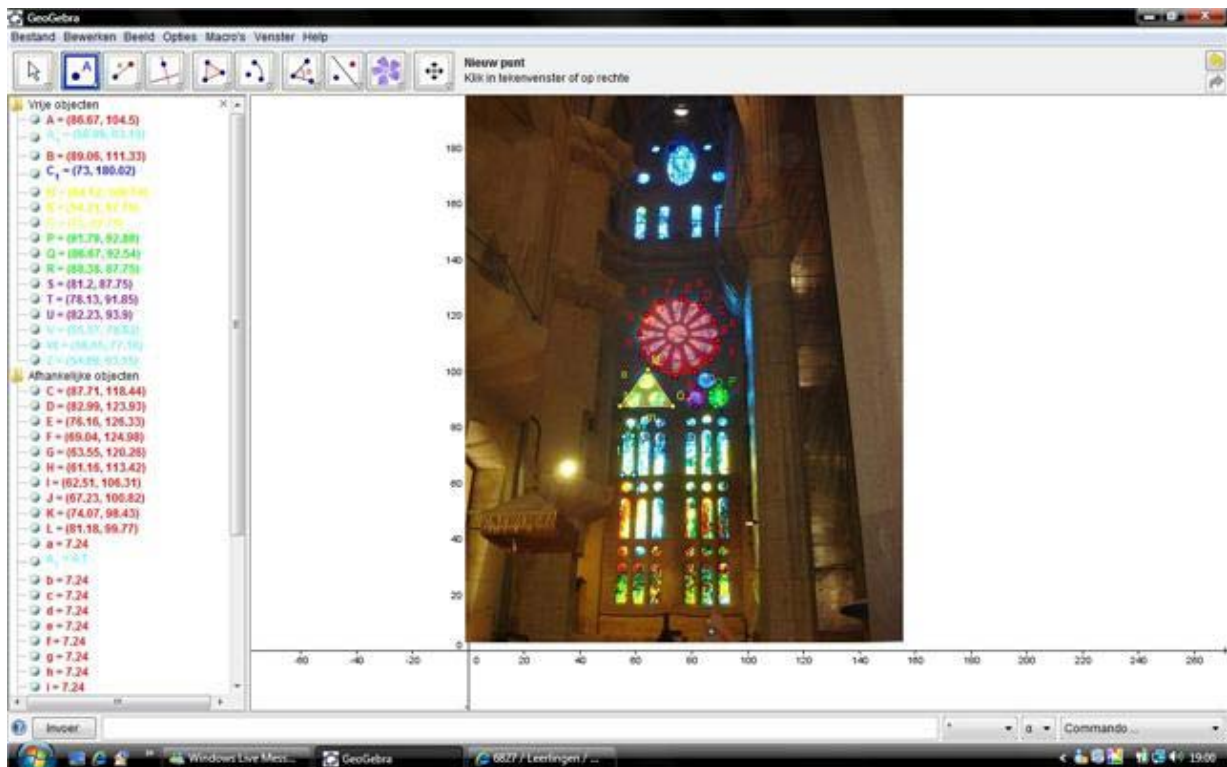
From this came the next data:

$M = (64.12, 100.74)$
 $N = (54.21, 87.75)$
 $O = (73, 87.75)$

$m = 18.79$
 $n = 15.73$
 $o = 16.33$

From this came that **poly2= 122.03**
This is the square measure of the yellow triangle

Now that we are in the area of small circles, it was assumed that we had to edit the circles. We had edited both circles, the small purple circle and the small green circle.



From this came the next data:

$$\begin{aligned}
 &P = (91.79, 92.88) \\
 &Q = (86.67, 92.54) \quad p: (x - 89.36)^2 + (y - 90.8)^2 = 10.25 \\
 &R = (88.38, 87.75) \\
 &S = (81.2, 87.75) \\
 &T = (78.13, 91.85) \quad q: (x - 81.15)^2 + (y - 90.92)^2 = 10.04 \\
 &U = (82.23, 93.9)
 \end{aligned}$$

From this came that **poly3= 32.21** . This is the square measure of the small circle.

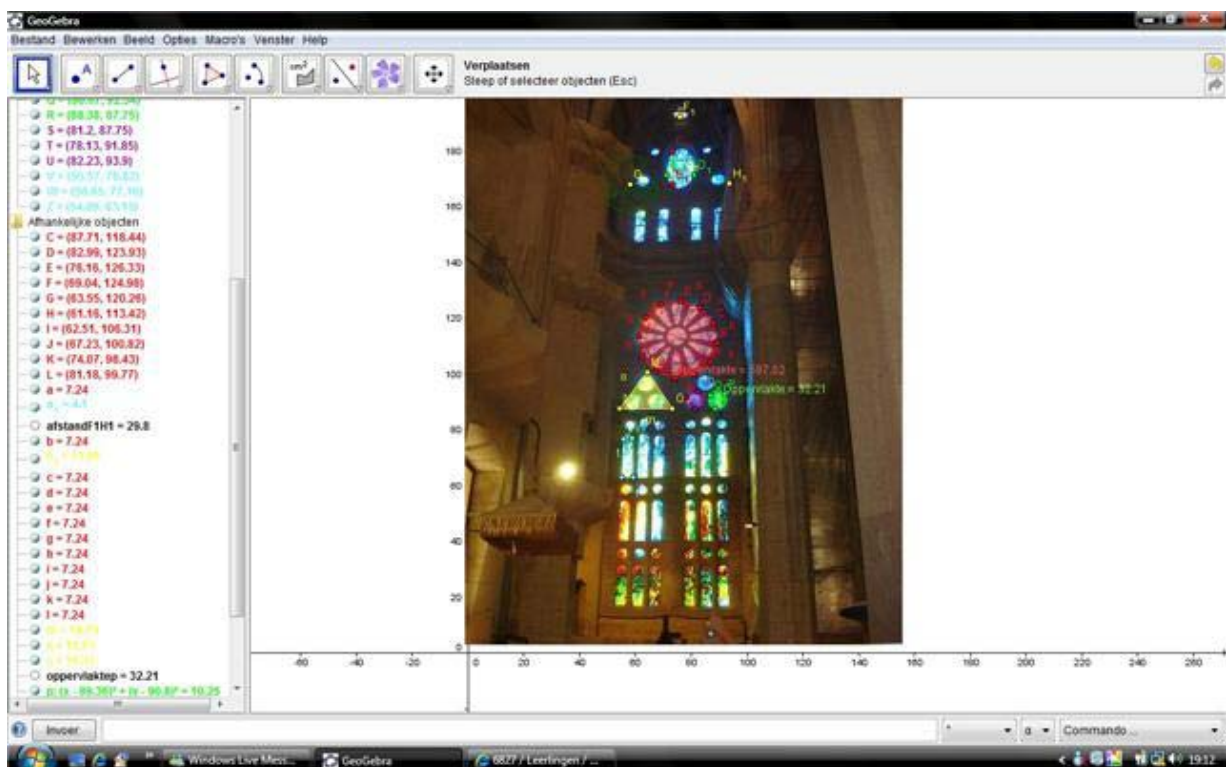
We also have measured a figure with a little bit of a varial structure. This is the only figure that has that.

From this came the next data :

$$\begin{aligned}
 &V = (55.57, 76.82) \quad r = 4.86 \\
 &W = (58.65, 77.16) \quad s = 13.69 \\
 &Z = (54.89, 63.15) \quad t = 14.01
 \end{aligned}$$

From this came that **a1= 4.1**

We then took a look at an other triangle as you can see. This one up in the top. As you can see all of these figures affect to look like a triangle.



From this came the next data :

$$F_1 = (75.73, 192.32)$$

$$G_1 = (57.96, 168.06)$$

$$H_1 = (93.5, 168.4)$$

Next we calculated using Geogebra the angle of the triangle. This triangle had the **angle of 306.77°**

Our full process looked liked this:



Edited Picture used by Geogebra

Conclusion

We have learned in this project a lot about how Geogebra works. It is always useful to provide additional information to learn, and certainly also in practice.

We found it in the beginning a bit difficult to work with Geogebra, but after a little practice we were more understanding and we worked a bit to understand. Then it was only a matter of finding and editing graphics. We have chosen figures that are not directly on the window, but the figures that were together. For example, triangles, triangles that were not clear, but still had the circles together a form of a circle.

The nice thing of this program is that for example an angle can be calculated. And that is exactly what we have learned from this project, if you have enough understanding and commitment putting into it things can be calculated that at first glance you may think not.