VISIT MATH

Co-funded by the European Union

Itinerary

Funded by the European Union. View and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.
Project code: 2022-1-FR01-KA220-SCH-000090275

Fermat SCIENCE · 5th High School Agrinio-Greece · Istituto Statale "E. Montale" Pontedera · LogoPsyCom · ZS 31 · YuzuPulse

VISIT MATH

Co-funded by the European Union

VisitMath Tours Agrinio

Fermat SCIENCE · 5th High School Agrinio-Greece · Istituto Statale "E. Montale" Pontedera · LogoPsyCom · ZS 31 · YuzuPulse

Hi, my dear friends

Greetings from the small city of Agrinio, Greece.

I am Maria. I have recently had an accident, so I realized that we have to help children with mobility problems.

Thus, I have devised a small contest to collect some virtual coins which our school will transform to real gifts for children in need.

So, help me to win as many virtual coins as possible to support the kids.

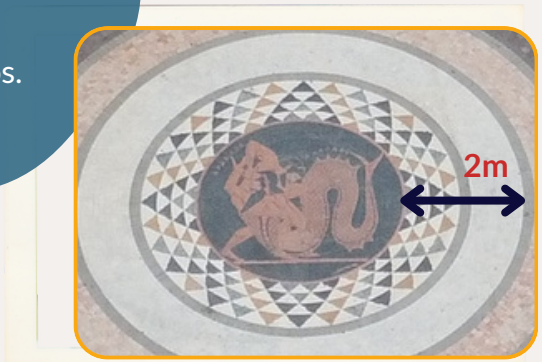
A virtual coin!

The city of Agrinio lies at the foothills of Mount Panaetoliko, between the river Acheloos and lakes Trichonida and Lysimachia. Water, which spreads over the city outskirts in every direction, is the dominant feature of the city.

Agrinio is the largest city in the prefecture of Aetoloakarnania in Western Greece and an important commercial centre of the region, the characteristics of which were formed mainly in the 19th and the 20th century. However, the dawning of its course in time dates back to the prehistoric period.

Step 1: Let's start from the city centre

The emblem of the city of Agrinio is the fight of Hercules with the god-river Acheloos.

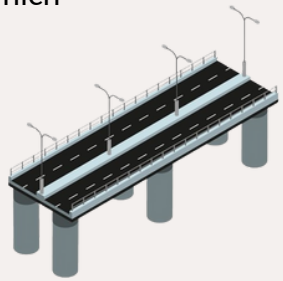


Knowing that the central circle with the emblem has a radius of 1m and the distance between the perimeter of the emblem and the external large white circle is 2m.

Calculate the area in m^2 and the perimeter in m of the two circles, the small with the emblem and the external white one.

Step 2: How long does it take to go from one end to other?

At the entrance of the city there's a bridge, which is a reference point in the city known as the "Aerogefyra".



At the other end of the city, in an almost straight line, the municipality park is located.

Normal walking speed is about 3 miles per hour. I guess, now, I would move at an average speed of 2 miles per hour. The distance between these two places is 2.4 km.

1 mile = ...meters

Please, help me to understand: How long would it take to go from one end to the other?
Use the 2 miles per hour speed.

Step 3: The tobacco industry

Tobacco warehouses of the Papapetrou Brothers

In the past, the famous tobacco merchants (Papastratos, Panagopoulos, Papapetrou and Heliou) created thousands of working positions, while many Greek banks opened branches there and funded the local companies. Tobacco cultivation had a significant impact on the city's culture.

It is a rectangular building. The length of the building is 67m and the width is 37m.
The first floor has an area of useful space of 1775 square meters (m^2).

Now I'm puzzled!

How much space in m^2 is lost on the first floor at balconies, architectural constructs, entrances, walls, etc.?

Please calculate the percentage of space lost in that case.

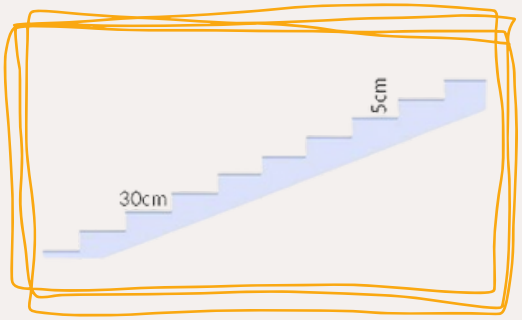
Step 4: Make our park more accessible

The Municipal park of Agrinio

It is an area once owned by the family of the poet, writer, essayist and translator K. Hatzopoulos and purchased by the Papastratos family in 1919, for the creation of a recreation area.
It was then donated to the municipality.French gardening and English landscape elements combined with the local stone represent a unique synthesis.

There are some accessible entrances to the park, but the one closest to my home isn't accessible. There are some very wide sidewalk steps to enter the park by this entrance.

The width of each of the 10 stair steps is 30cm and their height is 5cm.



Please, help me understand if the city engineers can build a wheelchair access next to the sidewalk steps.
You have to calculate the slope. I only hope it's less than 10% and that it could be built at once.

Just some help... You need to find the horizontal distance and the height from the lowest to the highest point!

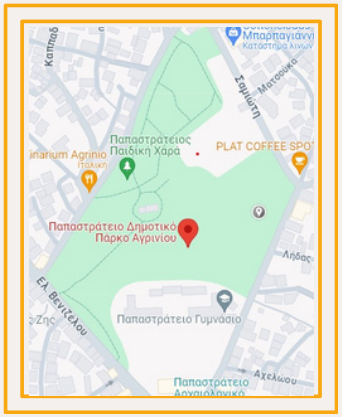
Step 5: How big is the park area?

It's not only a park…

The Archaeological Museum of Agrinio is located at the southeastern side of the Park of Agrinio. Plenty of exhibits from various locations of the prefecture, dating back the Neolithic era (7.000 BC) until the end of the Roman rule (4th century AD), are displayed there.

Next to it we can find the Glyptotheque "Christos Kapralos", the "Papastratia" Schools, and the public library.

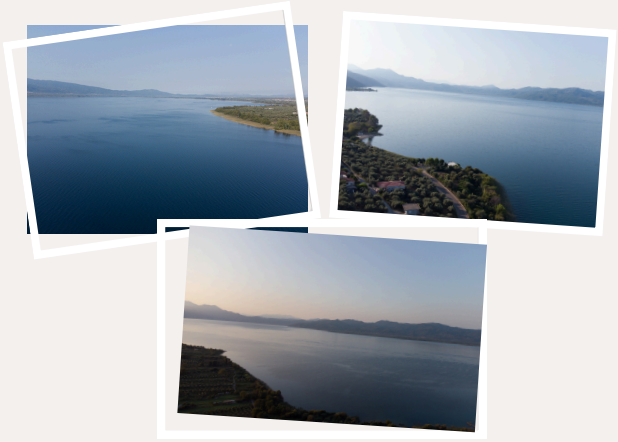
As you see in the next image, we can use Google maps to outline the park area. Don't you think it looks like a trapezium and if we squeeze it a bit it could be a parallelogram?



Can you estimate the acreage of the park area by using Google maps?
Do you think it is:
a) below 70,000m^2 ?
b) between 70,000m^2 and 90,000m^2 ?
c) more than 90,000m^2 ?

If you like, verify your results here https://www.mapdevelopers.com/area_finder.php and bear in mind that it's almost a trapezium.

Step 6: Let's have a short trip outside the city



Lake Trichonida is the largest lake in Greece. It is located in the Prefecture of Aetoloakarnania, southeast of the city of Agrinio.

It covers an area of about 98.6 square kilometers (38 square miles), with the maximum depth reaching approximately 58 meters (190 feet).

The smallest lake of Greece covers approximately an area of 10 square kilometers.

How many times larger is our lake compared to the smallest Greek lake?

Step 7: Finally, let's celebrate

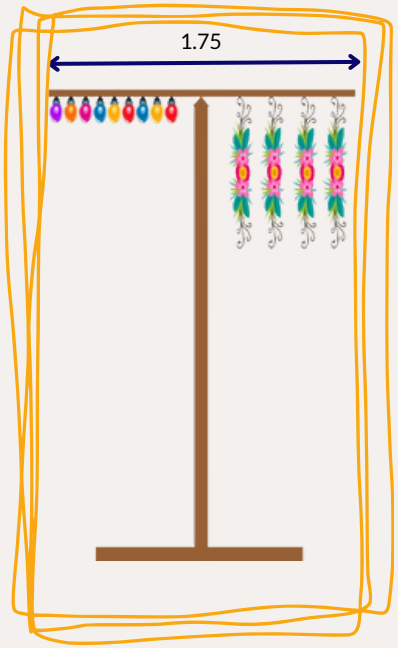
I know, I know… too many calculations… But there are for a good cause and, also, you can understand how architects and engineers create buildings and how Google and other IT tools provide info about distance, location, etc.

But to have a party we need to decorate! Can we be more creative?

I think it would be fun and a bit "nerdy"to balance the different ornaments on a pointed beam, as it is shown in the next image.

The horizontal stick is 1.75 meters llong.

Each of the nine lamps weighs 50gr. Each of the four hanging ornaments on the right weighs 150gr.



Please, find the center of mass (or gravity) of the stick; and then the light bulbs and the ornaments will balance.

In other words, what should be the length of the horizontal stick on the left side of the wooden spike, and how long should be the stick on the right side?

But be careful!!! Don't let anyone move your smart mathematical creation.