VISIT MATH

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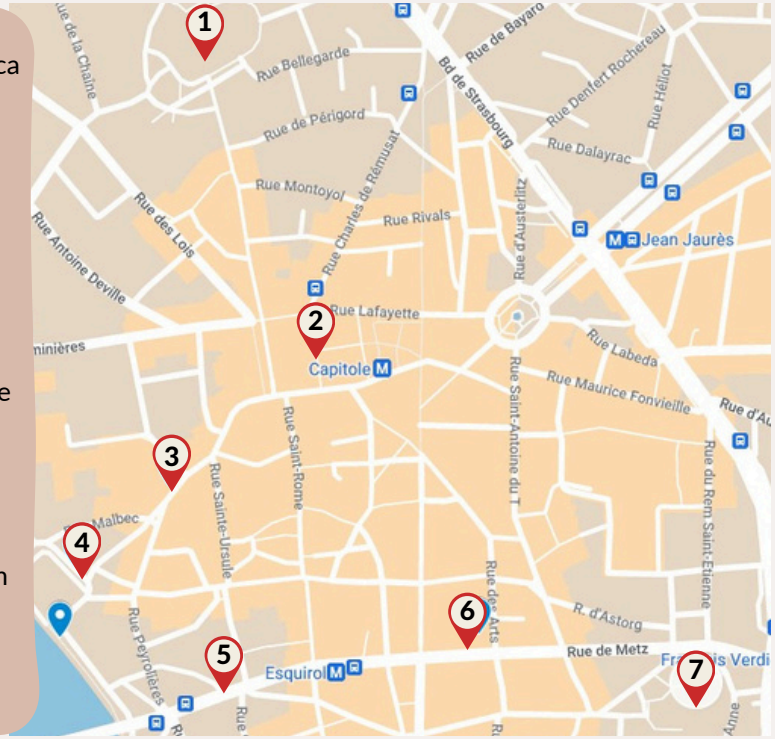
Itinerary

1. Saint-Sernin Basilica
2. Capitole Square
3. Pierre de Fermat College
4. Place de la Daurade
5. Assézat Hotel
6. Augustins Museum
7. Saint-Étienne Cathedral



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VisitMath Tour TOULOUSE

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Hello, my name is Annie.
I'm so happy to meet you!
I was parachuted into Toulouse by a Resistance plane.
I was entrusted with a mission of the utmost importance: broadcast a secret message to the representatives of the city's resistance so that they could ward off the imminent arrest of all their comrades. But first, I need to decode the message.
I fear that alone, this adventure will prove complicated...
I was told that you were on our side and that you were insightful; I am sure that together, we will carry out this mission on time!
Do you agree to help me?
Thank you so much!

Step 1: The splendid Romane

Here we are in front of the magnificent Saint-Sernin Basilica.
Isn't it glorious?

Pay close attention to all the details because the mission begins here!

Photo credit Fermat Science

Built at the end of the 11th century, it has been listed as a UNESCO World Heritage Site since 1998.
It is the most important Catholic religious monument in Toulouse and one of the largest in Europe.

Look at the octagonal bell tower and count the number of arcaded bays.

Answer =>

Perfect!

By the way, I forgot to show you the message to decode, I hid it in my pocket, wait a moment... Ha, there it is.

Anyway, this is my family portrait; I'm on the right. The only girl

The message is on the back

Now, head towards Rue du Taur, going around the basilica, heading south-southeast using a compass.

Step 2: The heart of the city

We arrive at the Capitole Square... What magnificent architecture!

I forgot to tell you that I will often change my outfit to cover my tracks...
There we go! This is an outfit that will help me go unnoticed.

Let's approach the facade discreetly, but be careful; we're out in the open!

An emblematic place in the city of Toulouse, the Capitole Square takes its name from the Capitouls, who were the town's magistrates. They belonged to the capitolate, the form of municipal administration of the city from 1147 to 1789.

Photo credit Flickr

This place is considered as the heart of the city. Until 1900 it was the centre of significant transport activity, particularly with stagecoaches and horse-drawn tramways. The square was also a marketplace, an activity that continues today. Its floor is decorated with an immense Occitan cross depicting the zodiac signs.

Can you uncover the curiosity hidden on the facade of the capitol? Add the vectors $\vec{A}$, $\vec{B}$, $\vec{C}$ and $\vec{D}$ from the main vertex of the isosceles triangle below the sloped roof represented by the pediment of the building! (the tiangle below the sloped roof)

Answer =>

Hint :
A vector is defined by a magnitude (or a size) and a direction.

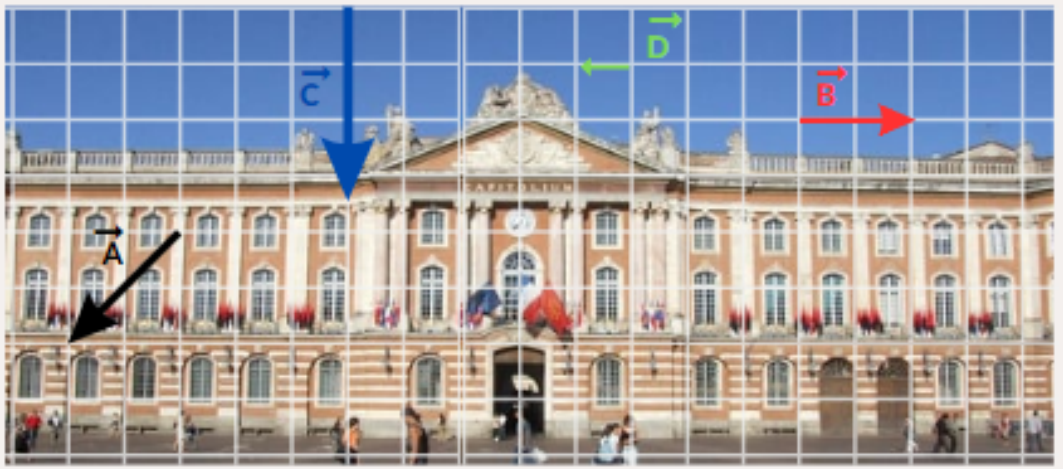


Photo credit Fermat Science

Wow! I am impressed by your sense of observation.

Let's not stay here too long, or we risk being spotted by the Gestapo.

Let's go ouest and take rue Jean-Antoine Romiguières, then the 2nd on the left towards the south, rue Joseph Lakanal.

Step 3: A famous mathematician

Let's move forward along this street until we find the large gate which leads to the Pierre de Fermat College.

Photo credit Fermat Science

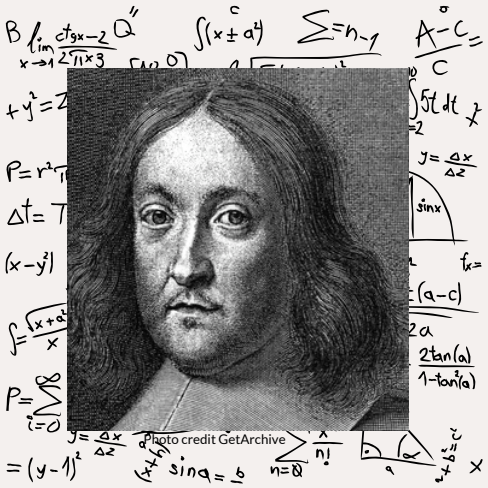


Photo credit GetArchive

Pierre de Fermat was born at the beginning of the 17th century in Beaumont-de-Lomagne, an old medieval bastide located not far from here in Tarn-et-Garonne.
The son of a good family, he became a magistrate in Toulouse, but above all, he was passionate about mathematics.
Indeed, throughout his life, he devoted himself to studying mathematical laws, and several theorems bear his name. One of the best known, “Fermat’s Great Theorem”, was only demonstrated in 1994 by Andrew Wiles, an English mathematician, more than 300 years after the death of Pierre de Fermat.

Find the levelling plate near the gate and compare it with the curiosity found in step 2.
Calculate the difference between the two:

Answer =>

Leveling plates, which can be found in several cities in France, give the altitude from sea level. Architects and builders take them as a reference in order to calculate other altitudes, during construction work. urban planning for example.

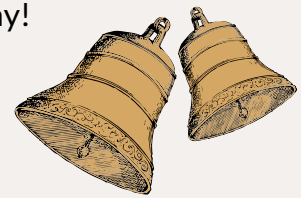
You may have noticed a vast, austere-looking building right next to us. This is the Jacobins convent, a jewel of medieval art in the Gothic style.

The interior is spectacular and worth the detour in particular with shaped columns palm tree!

Photo credit Wikimedia Commons

Step 4: At the water's edge, Dame Garonne

I hear the church bells ringing.
Time is running out; let's not delay!



Quickly! I need to change my outfit; I don't want anyone to recognise me.
This will be much more practical to continue...

Let's take rue Joseph Lakanal toward the South East.
We will head southwest towards Rue Gambetta and then Rue Jean Suau at the corner of this street until Place de la Daurade.

Photo credit Wikipédia


Photo credit Wikipédia

Place de la Daurade takes its name from the Church of La Daurade, built around the 6th century. Very quickly, this place became a place of commercial exchange and transport due to the presence of a port on the shore. Since 1943, the Place de la Daurade and the banks of the Garonne have been protected as a remarkable site.

Let's take the descent to the esplanade below to reach the bank of Dame Garonne.

The Garonne is a river that originates in Spain in the Pyrenees mountains range and flows into the Atlantic Ocean. Dame Garonne is very capricious with impressive flood episodes. Until the 19th century, it was an essential economic place with the navigation of boats transporting goods and various activities such as sand fishermen, pebble cutters, mail transport...

The Garonne flows at an average rate of 630 m^3/s over an estimated constant section of 1200 m^2.
There are 325 km of banks between Toulouse and Bordeaux.
How many days will it take for a drop of water leaving Toulouse to arrive in Bordeaux?
Answer =>

Help :
qv (river flow in m^3/s) = v (water speed in m/s) x S (area of the river passage section in m^2).

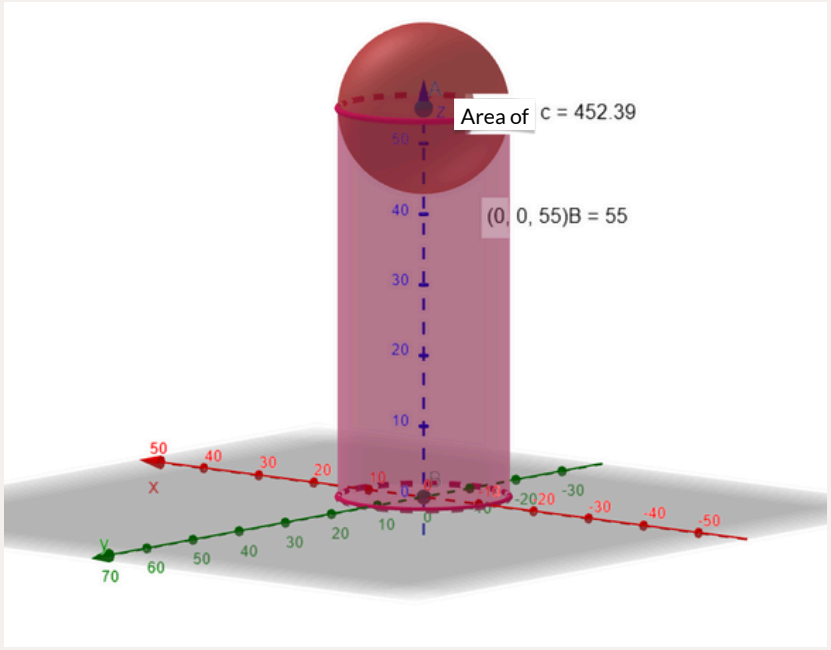
Now, in line of sight, we see a dome on the other side of the bank.
Can you see it?
It looks like a lighthouse in the middle of the city.

This is the Dôme de La Grave.

Photo credit Fermat Science

This dome is that of the chapel built between the 17th and 18th centuries, which is an integral part of the Saint Joseph de la Grave hospital.
The name La Grave comes from the gravel bed of the Garonne on which this complex was built.
Overlooking the Garonne by 85 meters, it is a landmark for residents and one of the most photographed monuments of the pink city.

Let's imagine this dome does not have a skylight at the top (part resembling a glass cage).
We approximate the total building to a cylinder with an AB height of 55m and 24m in diameter and a half-sphere whose center coincides with that of the upper circle of the cylinder denoted c.
Can you calculate its total volume?



Answer =>

Hint:
π having a numerical value of approximately 3.14
Volume of a cylinder: V = base area x height
volume of a sphere: $V = 4/3\ \pi\ r^3$

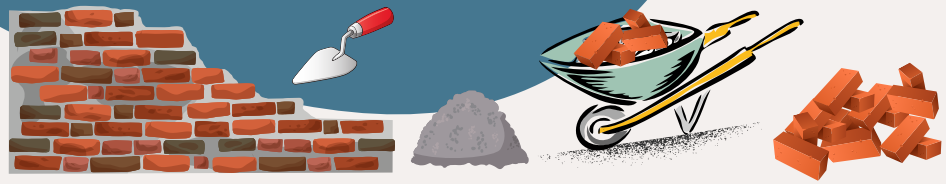
Well done! You are a big help

Let's move forward on Promenade Henri Martin to our left, towards Pont-Neuf.

Here we are in front of another emblem of the pink city, the **P**ont-Neuf.
Oh yes, by the way, do you know Toulouse is nicknamed the pink city?
And do you know why?
Well, it's simply because of the colour of the fairground bricks and tiles used to construct the buildings. The reflections in the setting sun are even more spectacular.

Admire its beauty, a true architectural masterpiece!

Contrary to its name, this bridge is the oldest in Toulouse. It was inaugurated by the young King Louis XIV in 1659. However, it took almost a century to complete its construction, using innovative techniques different from those used for medieval bridges. It was also the only bridge in the city that withstood the terrible flood of 1875. Two hundred twenty meters long from its inauguration, it was a strategic crossing point in the town and today a place for walks appreciated by residents.



How many arches does this bridge have?
Answer =>
Is it a prime number?
Answer =>

Hint:
Prime numbers are natural numbers greater than 1 that are only divisible by 1 and themselves, leaving no remainder.

Perfect!
One more element for our secret message.

It is time to resume our quest.

This outfit will be a perfect illusion. No one will be able to recognise me.

We have to turn back and go back up to Place de la Daurade.
Then, we will go towards the southeast on the quays of the Daurade, which overlooks the Garonne, and finally, we will arrive at the Place du Pont-Neuf.

U-turn, my comrades, let's go!

Step 5: A pastel-colored home

Here we are, look to the right, you can see the entrance to the bridge.

Let's join the sidewalk opposite and head east-north-east, rue de Metz. Take care when crossing!

But what is that noise?

Oh! Look in the sky! The plane that parachuted me is turning in the same direction! This is undoubtedly a sign that we are on the right road but also that we have little time left for the mission!

Meet at number 16 rue de Metz on the sidewalk opposite the Hôtel d'Assézat.

This 15th-century Renaissance-style mansion was built at the request of Pierre d'Assézat, a wealthy merchant of pastel (a plant used in dyeing nicknamed blue gold). This hotel currently houses the Bemberg Foundation Museum, an Argentinian collector. Multiple works of art by different artists are exhibited there.

Photo credit Wikimedia commons

Here is the facade of the Hôtel d'Assézat.

Find as many geometric figures as possible on the facade and draw them on this photo.

Well done! You are too strong.

Now, let's take Rue des Marchands heading east-southeast. We will first arrive at Trinité Square and then continue straight on to Rouaix Square. The opportunity along the way to observe the two fountains and look up to appreciate the architecture of the monuments.

At Rouaix Square, we head east towards Rue Croix Baragnon.

Step 6: The Fine Arts meeting

No. 23 of this street is essential for the resistance. The Lion brothers help us and provide their printing press for printing leaflets, newspapers...
Have you spotted its location?

Please don't turn around; I have the impression that we are being followed...

Quickly we will outrun them! Follow my instructions:

- Retrace our steps,
- then go north, take rue des Arts (the first street on the right),
- then first left towards the west,
- and finally first right towards the north.

Phew, that's good; we got rid of them!

Here we are next to the Augustins museum.

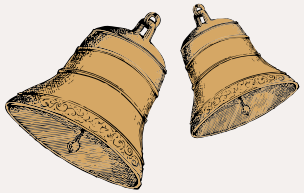
By carefully observing the facade of the museum on Rue Alsace Lorraine, spot the inscription of the word "Museum" under an arcade. In addition to the "M", there is another Roman numeral.
What is this number?

Answer =>

Hint :
this number is the number of sides of a pentagon.

The Musée des Augustins is one of the first museums in France. Created in 1795 after the French Revolution, the building was originally a convent built from 1309.
Of typical Toulouse architecture, it houses many works of art.
Its magnificent cloister is ideal for strolling and serves various exhibition rooms.

The bells are ringing again; time is running out! There is no more time to waste if we want to complete the mission on time and decipher the secret message.



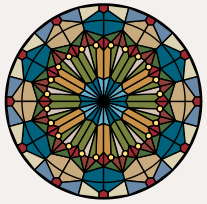
Let's quickly reach Saint-Étienne Cathedral by taking Rue de Metz heading east. Then head south-southeast rue Boulbonne.
We will see it to our left towards the east.

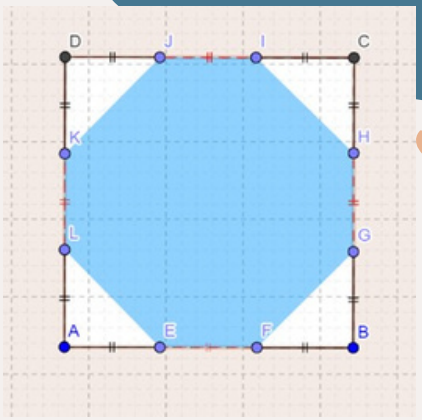
Step 7: A curiosity

This is Saint-Étienne **C**athedral.
Another magnificent architectural work and a pretty octagonal-shaped fountain on its square.

Photo credit Wikipedia

The first traces of this cathedral date back to 1071.
Its bell tower has 17 sacred bells, and its interior stained glass windows date from the 14th century.
Its facade is decorated with a vast rose window inspired by that of Notre Dame de Paris, as well as a clock.





The fountain on the square is an octogon. Will you be able to take on the challenge of calculating its area?
Answer =>

Clues :

- Let say the KL segment = 1,50 m and DK segment = 1m.
- The octogon is contained within a square.
- It is completed by triangles to form the square.
- Pay close attention to the coding of the square, it will allow you to begin the exercise.

You are truly amazing!

There remains a final challenge to take up, and this will allow us to read the hidden message.

Follow Toulouse's violet, emblematic flower and find the letters hidden in the words to reconstruct the message.

Bravo!

Tremendous!
We accomplished the mission on time.

Now, I must leave you in order to carry the message by telegraph and broadcast it on the resistance's encrypted radio.

Bye!

Thank you to all of you.
Your comrade Annie.

If you want to discover more about the city of Toulouse and its surroundings, go to the Tourist Office at the Donjon du Capitole Square Charles de Gaulle.