



## MATHEMATICAL FOOTPRINTS

# Vid, Croatia



- You have 45 minutes to complete the game
- After completing everything, you must give your papers with solutions to the teacher

#### Members of the group:

Name:	Country:

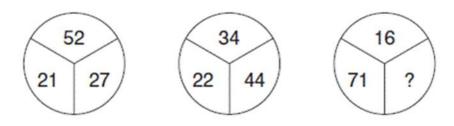
#### 1. Narona



Narona was one of the most important ancient cities on the Croatian Adriatic coast. It was founded as a Greek emporium in the 3rd or 2nd century B.C., and became a major Roman stronghold during the 2nd century B.C. as a part of the Roman province of Dalmatia.

According to historical documents, Narona was first mentioned by the Greek historian Pseudo Scylax as an emporium and triremes navigation port on the River Neretva. The Greek geographer Strabo also provided information that Narona was mentioned as a trade city by Theopompus, another Greek historian.

Enter the missing number.



The sum of the digits of the entered number will reveal in which century B.C. Narona was mentioned for the first time.

The first mention of Narona was in the\_\_\_\_\_\_ B.C.

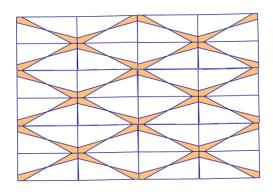
# 2. Roman temple

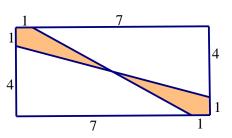
During the 2nd century B.C., Romans became very interested in Narona. In 156 B.C., Roman soldiers lead by Gaius Marcia Figulus waged war against the Daors. They probably used Narona as their main base.

After the Octavian's war in 33 B.C., there was a significant influx of population in Narona. For that reason, Narona became a colony during the Caesar's or Augustus' rule. During the Roman Empire, buildings of public importance were built in the city, such as the forum, temples, thermae, the theater etc.



In the bottom picture you can see a pattern of a Roman Temple paving.





Calculate the size of the shaded region of given rectangular tiles?

### 3. Roman temple

Until recently, Narona has never been systematically excavated. Like the other Roman cities, Narona had the same public buildings. For example, it probably had a forum with temples of Eskupal and Augustus. The so-far revealed Narona's heritage is very rich. This is visible in the monuments of a highly artistic standard found in Narona. The artistic work is partially important. Most of them were made in Narona, in the artistic workshops for construction, sculptures, painting, mosaics, artistic manual trades, etc.

There are many sculptures made of statuary marble, such as the statues of emperors, their families and statues of cultural significance. There are Mercury's and Livia's heads in Oxford. In the same collection, there is also the emperor Vespasian's head. Scholars consider it to be one of the best preserved Vespasian's portraits found in South-Eastern Europe.





Find and sketch at least one Roman remains built into local residents' houses.

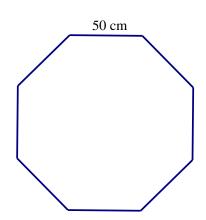
#### 4. Baptistery

In the end of the sixth and the beginning of the seventh century, Avar and Slavic tribes came to the Balkan Peninsula travelling from their original homeland in the area between Russia and Poland. The Croatians were among those tribes. The old Roman population and the Illyrians, who were mostly under Roman Influence, could not stand up against them. The Avars and the Slavs demolished Roman cities, including Narona. After their arrival, they established principalities, one of which was the Narentine Principality extending between the rivers Cetina and Neretva.

On the site of today's church of St. Vid, in the 5th century there was a single-nave early-Christian church with a semicircular apse, a vestibule and annexes on the north and south sides of the church. In one of the northern annexes, a baptistery was built at the same time as the church.

The location of the baptistery north of the church is common in Dalmatia, but this one has an octagonal shape and is decorated by painted plaster which imitates marble – an unusual design for this area. The knee washer had staircases from the north and south sides, it was 1,15 m deep, and used for baptizing by immersion.





Determine the volume of the baptismal chamber.

## 5. The Narentines

The Narentines were historically known as pirates. That occupation often caused battles with the Venetians during the ninth century. Their biggest battle with the Venetians was the one in the sea near Makarska, in 887. After that battle, the Venetians pledged to pay the Narentines the tribute for sailing along their coast for over a century.



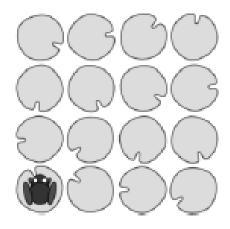
Captain Sparrow and his pirate company dug out a few gold coins. They divided the spoils among themselves so that each of them received an equal number of gold coins. If there were 4 pirates less, then each would get 10 gold coins more. If they had found 50 gold coins less, then each of them would get 5 gold coins less. How many gold coins did they dig out exactly?

# 6. Neretva specialties

While enjoying the landscape of the region, tourists can sample the delights of many specialties; including fish and frogs, as well as the fruits and vegetables which grow here in abundance. Cruising in an ancient Neretva boat through the meandering rivulets and channels of the Neretva valley, one can enjoy the clear waters of the Norin, a tributary of the River Neretva.

Stories are told of sunken towns, of ancient heroes and famous travelers who wrote down their fascination with the region, thereby recording their impressions of the Neretva valley for eternity.





On the River Norin, there are 16 water lilies arranged in a 4x4 form, as shown in the picture above. On one of the lilies, a frog is sitting in the bottom left corner. It can move horizontally and vertically from lily to lily, so that it always skips at least one leaf and never lands on the same leaf twice. Note that this rule does not apply to the starting lily. What is the largest number of jumps that the frog can do?