

Mathematical logical problems

1. LOUSE AND HAIR

Louse is on the hair and it is moving with speed of 2 cm per hour. Hair is growing with speed of 1cm per hour. If the louse is 3cm away from the end of the hair, when will it get to the end of hair?

2. BUMBLEBEE FLIGHT

Two train, the direct distance of 800 km, are moving to each other in the same time. One train is moving with constant speed of 40 km per hour, and the other with constant speed of 60 km per hour. At the same time, bumblebee starts to fly from the beginning of one train, with speed of 80 km per hour, to the other train. When he touches the other train, he spins around and fly again to the first train (with the same speed). He continues to fly from one to another train while the trains do not collides. How many kilometers did he pass?

3. TWINS

Two brothers, twins, of which one always lies, and the other constantly speaks the truth, are at the crossroad where one road leads to "life" and the other to "death". " Passenger is coming at the crossroad and, has the right to ask only one question only one of the twins, and find out which way leads to life! However, passenger don't know wich one of the twins lies, and wich one tells truth. Which question should he ask?

4. BRITHDAYS THAT MATCHES

At the party, which was organized by Bojca on the occasion of publishing this site were 25 guests. What is likely to have two guest that were born the same day of the year (same date)? What do you think if there were 70 guests, what would then be likely to have two guests born the same day?

5. WHERE IS A EURO?

As per usual, the authors of this site ,Mladja , Aca and Bojca met that morning at saloon. Seted a little and when was time to pay the bill, waiter says 25 euros. Each of them gave 10 euros. Waiter, as per usual, says that there are no small change back to 5 euros, so he returnes to each one of them 1euro, and two kept for himself. So, each one of them paid $10-1 = 9$ euros, $9 \text{ times } 3 = 27$, and two that took waiter, $27 + 2 = 29$ euros. Where is 1 Euro?

6. HOW TO SHARE 17 HORSES

Three brothers have to divide 17 horses which their father left in the heritage, the oldest of the brothers gets $\frac{1}{2}$ of all horses, middle one $\frac{1}{3}$, and the youngest one $\frac{1}{9}$. They weren't able to divide them like that because 17 is prime which is not divisible by 2, 3 and 9, so brothers borrow neighbor's horse. Since they divided 18 into appropriate parts of the Testament, first one gets 9, the other 6, and the third 2 horses. It is 17 and they returned horse to a neighbor. Is the division conducted properly according to will?

7. ACHILLES AND TURTLE

Achilles runs 10 times faster than the tortoise. At the moment when they started running, Turtle had 100 meters advantage. While Achilles runs the 100 meters, Turtle is 10 meters away and Achilles is not yet there where she is. While he passes 10 meters Turtle will exceed 1 meter, and the Achilles has not yet arrived, and so on. So, by this Achilles will never get Turtle! Do you think properly?

8. WHO IS THE MURDERER?

In some town is killed some professor Pera, last Detlic. Police arrested three people who were suspicious, professor Kosmosić, professor Ding dong and professor Planetić. The magistrate was convinced that one of them is the killer. On hearing the suspected stated:

1. Kosmosić: I'm not a murderer. I have never seen Ding Dong. I knew the late Professor Pera Detlic.
2. Ding Dong : I'm not a murderer. With Kosmosić and Planetić I have always played poker. Kosmosić is not a killer.
3. Planetić: I'm not a murderer. Kosmosić is not telling the truth when he says that he never saw Ding dong. Kosmosić didn't not know the assassinated.

With the assumption that the murderer is arrested and all the respondents said one lie in three of the claims, discover who is the murderer.

9. TWELVE PELLETS

It is known that in the group of 12 pellets are 11 by weight equal pellets, and one pellet which has different weight than the others.

10. TRIANGLES FROM MATCHES

Twelve matches are distributed in the plains so they form six equilateral Triangulars.

- 1) Move two matches to create five equilateral triangulars.
- 2) Starting from the new Schedule displace two matches to get four equilateral triangles.
- 3) Starting from the new Schedule displace two matches to get three equilateral triangles.
- 4) Starting from the new schedule move two matches to get two equilateral triangles.

Mention that equilateral triangles don't have to have the same size.

11. PICTURE ON THE WALL

In a museum is a well-known picture on the wall with dimensions are 3 times 3 meters. The lower edge of the picture is 1 meter away from the viewer's eye level. With which distance from the wall is the best view to the picture?

12. MYSTERIOUSLY NUMBER 22

Select a three-digit number with different figures. Write all possible two-figures numbers with different digits that can be made of the numbers from selected three-digit number. Then gather those two-figures numbers and share with the initial sum of digits from three-digit number. Which number did you get? Try again, and again ...

Example:

Select the number 123. We can make a two-figures numbers with different figures 12,13,21,23,31,32. Gather this six numbers: $12 + 13 + 21 + 23 + 31 + 32 = 132$ and share the sum with figures of initial number: $1 + 2 + 3 = 6$.

So: $\frac{132}{6} = 22$ We always get 22. Why is that?

13. CENTER OF THE CIRCLE

Using a caliper determine the circle center. (No rules and pencils)

14. NAPOLEONS TASK

Using only a caliper divide the Circle which is the center of the known four equal parts.

15. FRIDAY 13.

The authors of this site claim that Friday is on 13th day of the month, more than any other day! Is it not it a little strange!?! Please check...

16. COW, GOAT AND GOOSE

Cow devour as much grass as the goat and goose together. Cow and goat together devour meadow grass for 45 days, cow and goose for 60 days, a goat and goose for 90 days. For how many days can cow, goat and goose together devour the entire meadow? Difficulty is that the grass is continually growing.

20. PROPER PENTAGON

Take a rectangular piece of paper, for example, length 20 cm and width 3cm and without any tools (rules, nurses ...) make proper pentagon from it.

21. SEVEN CIGARETTES

Put seven cigarettes in such a position that each one touches six others. Is it and under what conditions this possible?

22. THREE WISE MAN

After a hard day on the road, three wise man decided to spend a night on the edge of the forest. While they were sleeping, one of their students smirched their faces with color. When they wake up in the morning, each of the wise man saw the faces of the other two, and thinking that his face is clean, started to Laugh. The smartest one, however, quickly got serious realizing that his face is colored too. How did he think

23. HOW MANY YEARS THE GIRLS HAVE?

Two friends, who did not see each other for a long time, talk about their families:

- How many children you have?
- Three, all three daughters.
- How many years they have?
- Product of their years is 36 , a sum is equal to a number of that house .
- You heaven't told me enough.
- Yeah, right, the oldest daughter plays piano.

How many years has each one of the girls?

24. MOUSE

Circumference of the Earth around the equator is approximately 40054719 meters. Imagine a situation that the line can be corrected and extend for 1 meter. Crank it again and make a circle. By logic actually it is made a small "gateway" (in mathematics known as a circular **ring**). **Can a mouse go through it?**

25. THE SILENCE OF THE LAMBS

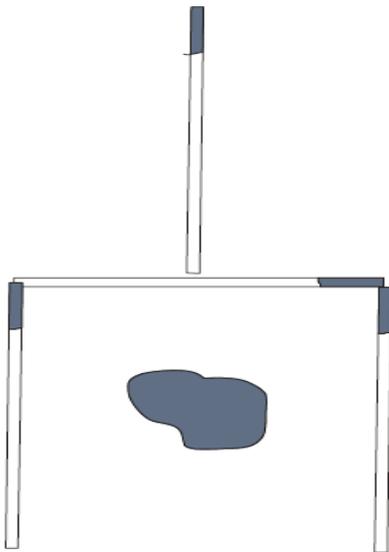
Cutthroat got a task from the owner to kill 30 lambs for 7 days. However, the boss is expressly ordered that each day he has to kill **odd number of** lambs and every day **at least one lamb**. **How can cutthroat do that?**

26. CHESS BY TWO STROCKERS

In chess party "by two moves" players draw two strokes, first one than another. Other rules are the same as in regular chess. **Is there a strategy for the player who plays with black figures so that he can win each party?**

27. DISCHARGE BALLS

Four matches form shovel, which is full of dung (on the picture).



It is necessary to move only two matches so the dung can be out of the shovel!

28. ONLY ONE EIGHT IS KNOWN

$$\begin{array}{r} \text{xxxxxxxx: xxx} = \text{xx8 xx} \\ - \text{xxx} \\ \text{xxxx} \\ - \text{xxx} \\ \text{xxxx} \\ - \text{xxxx} \\ \text{0_no rest} \end{array}$$

In the displayed sharing scheme of two whole numbers it is known only one number – in the result of sharing the third number is **eight**. **It is necessary to restore sharing and to replace each x with corresponding figures.**

29. SAND BLAST CLOCKS

We have two clocks of sand that measures time of 3 minutes and 5 minutes.
How to measure with them 7 minutes?

30. SIX HOUSES AT THE ROUND

Unkempt and wild area is surrounded by circular length of 31 km. Along it are six houses and the distances between houses (in miles) are different whole numbers.

The distance between any two houses **is not the same** with the distance between any two other houses! **In which mutual distances are houses along the way?**

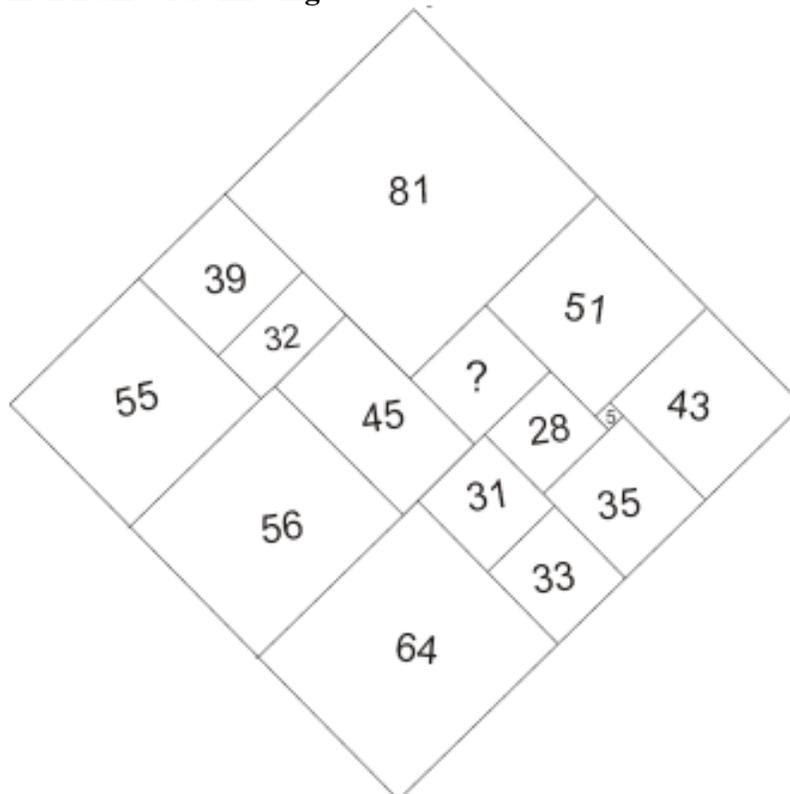
31. WARPING

We have a piece of paper, rectangular shape, with 8 numbered squares.

1	8	2	7
4	5	3	6

32. LITTLE INTELLIGENCE TEST

Figure out which number is missing!



Many of these problems you have already seen and solved. Some of them are known from "older times". Several of them were the task on the exam on faculty. ! If you want to test your solutions and confirm INTELLECTUAL SATISFACTION, email it to us at address matematiranje@gmail.com and we will send you answer.

Thank you for spending time with us and good luck!