

MATHEMATICS COMPETITION FOR THE SEVENTH  
GRADERS OF SATAKUNTA, 12–16 APRIL, 2021

- The time allotted is 50 minutes.
- The allowed tools are writing and drawing instruments, i.e. pencil, paper, eraser, ruler and compass. Calculators and mathematical tables are not allowed.
- Each problem is worth one point. Wrong answers are not punished.
- The problems are not ordered in increasing difficulty, but the first problems are likely to be easier than the last ones.

1. Compute  $1 - 6 + 10$ .

- a) 1    b) 2    c) 3    d) 4    e) 5

2. Compute  $2 + 20 + 200 + 2000 + 20\,000 + 200\,000$ .

- a) 222 222    b) 2 468 102    c) 24 422 190    d) 22 222 222    e) 100 000 002

3. There are 60 sweets in a bowl. One third of the sweets are salty liquorice and the rest of the sweets are fruit sweets and chocolate. There are eight chocolates more than salty liquorice. How many fruit sweets there are in the bowl?

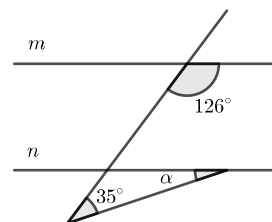
- a) 4    b) 7    c) 10    d) 12    e) 20

4. We write integers divisible by five in order of magnitude starting from the number five: 5, 10, 15, 20, ... What is the last number of the 2021th term in the sequence?

- a) 0    b) 2    c) 4    d) 5    e) 7

5. The lines  $m$  and  $n$  in the picture are parallel. Compute the value of the angle  $\alpha$ .

- a)  $2^\circ$     b)  $7^\circ$     c)  $15^\circ$     d)  $19^\circ$     e)  $35^\circ$

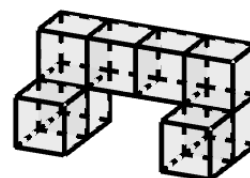


6. Aino has five mystery and three fantasy books. Leo borrows one mystery and one fantasy book from Aino. How many different ways there are for Leo to choose the two books?

- a) 1    b) 8    c) 15    d) 27    e) 125

7. The object below consists of eight small cubes. The side length of each small cube is 1 meter. The object will be painted green. One litre of painting is needed for paint ten square meters. The paint is sold in one litre paint buckets. How many paint buckets are needed?

- a) 1    b) 2    c) 3    d) 4    e) 5



8. How many positive integers satisfy the following: its reciprocal is at least as large as the integer itself?

- a) 0    b) 1    c) 7    d) 11    e) more than one hundred

9. Each point on a line is coloured red or blue. When we select any line segment whose length is 3 on the line, then the endpoints of the line segment are different colours. Which one of the following is a length of a line segment that has endpoints of different colours and is sure to be found on the line?

- a) 5    b) 9    c) 12    d) 14    e) None of the previous

10. On a coast  $A$  of a strait there are ten people and a boat. The people would like to travel to the opposite coast  $B$  by the boat. The strait can be crossed by the boat if there are two or three people on the boat. What is the smallest number of crosses which have to be made by the boat so that all of the people manage to travel to the coast  $B$ ?

(One cross means traveling from the coast  $A$  to the coast  $B$  or from the coast  $B$  to the coast  $A$ . Hence, one back and forth trip requires two crosses. At the end, the boat remains on the coast  $B$ .)

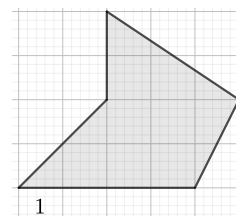
- a) 7    b) 8    c) 15    d) 19    e) 20

11. The delivery time for a product purchased from Internet is stated to be 2 – 6 weekdays. On which one of the following days the product can arrive?

- a) On Monday    b) On Wednesday    c) On Friday  
d) The product can arrive on any of the previous days regardless of the ordering date.  
e) None of the previous

12. In the picture, the side length of a bigger square is 1. For example, the lower side of the dark figure is 4. Compute the area of the dark figure.

- a) 9    b) 10    c) 15    d) 17    e) 20



13. Compute  $\frac{1}{2} - \frac{1}{4} + \frac{1}{8} - \frac{1}{16} + \frac{1}{32} - \frac{1}{64} + \frac{1}{128} - \frac{1}{256} + \frac{1}{512} - \frac{1}{1024}$ .

- a)  $-\frac{1}{1024}$     b)  $\frac{535}{1024}$     c) 0    d)  $\frac{1}{2}$     e)  $\frac{341}{1024}$

14. There are square shaped chocolate bars in the chocolate shop. We buy two chocolate bars which have 65 pieces in total. How many different possible options there are for the number of pieces in the smaller chocolate bar?

- a) 1    b) 2    c) 4    d) 32    e) 65

15. There are 24 pupils in a class. During the winter, 17 of them have ice skated and 17 of them have skied. Some of the pupils have also sled or done slalom skiing. When we randomly select a pupil, then with

- $\frac{1}{24}$  probability (s)he has not done any of the previous sports during the winter,
- $\frac{7}{8}$  probability (s)he has ice skated or skied and
- $\frac{7}{8}$  probability (s)he has skied, sled or done slalom skiing.

How many of the pupils have at least **both** ice skated **and** skied during the winter? (These pupils may also have sled or done slalom skiing.)

- a) 10    b) 11    c) 13    d) 15    e) 17