

### Accelerated math. Homework 3.



Problems marked with \* are more difficult.

1. Andrew prepares for an ironman competition. For that he swims for 37 minutes every day during 256 days and also he runs for 63 minutes every day during 256 days. How many minutes does he spend doing sports? (how to solve this problem by the easiest way?)
2. On a remote island, there are two villages. All villagers from village “One” always tell the truth, and all villagers from village “Two” always lie. At a meeting of several islanders, everybody says: “You are all liars!”. How many villagers from village “One” were there at the meeting?

3. \*  $x$  is a natural number.

Among following statements 3 are true and 2 are false.

$2 \cdot x$  is greater than 70

$x$  is less than 100

$3 \cdot x$  is greater than 25

$x$  is not less than 10

$x$  is greater than 5

What is  $x$  ?

4. Compute by the most convenient way (use commutative, associative or/and distributive property of addition and multiplication:

a)  $25 + 65 + 75 =$

g)  $5 \cdot 76 \cdot 2 =$

b)  $5 \cdot 12 \cdot 4 =$

h)  $138 \cdot 48 + 138 \cdot 52 =$

c)  $17 + 34 + 83 =$

i)  $67 \cdot 149 + 149 \cdot 33 =$

d)  $25 \cdot 8 \cdot 4 =$

j)  $62 \cdot 126 + 38 \cdot 126 =$

e)  $27 + 16 + 234 + 123 =$

k)  $150 \cdot 6 =$





f)  $50 \cdot (346 \cdot 2) =$

l)  $520 \cdot 4 =$

5. One straight line divides a plane into 2 parts. How many parts do 2 straight lines divide a plane into? Three lines? Find all possible solutions. (\*Four lines? Try to find all possible solutions.)

- 6.
- Michel drew three lines, no two of which are parallel, and marked 2 points on each of the three lines. He marked 3 points altogether. How can this be?
  - Michel drew three lines, no two of which are parallel, and marked 2 points on each of three lines. He marked 4 points altogether. How can this be?

7. Draw the picture as below in your homework and mark with color pencil

- |                 |   |
|-----------------|---|
| a. Line $AB$    |  |
| b. Segment $AB$ |  |
| c. Ray $AB$     |  |
| d. Ray $BA$     |  |

(When drawing use 2 rulers to draw parallel lines. Try to draw a nice picture)

8. Draw the line  $a$  and mark points A, B, C, D, K on the line  $a$  so that
- Point C belongs to the segment  $[AB]$  ( $C \in [AB]$ )
  - Point D belongs to the ray  $AB$  and doesn't belong to the segment  $[AB]$  ( $D \in (AB)$ ,  $D \notin [AB]$ );
  - Point K belongs to the ray  $BA$  and doesn't belong to the segment  $[AB]$  ( $K \in (BA)$ ,  $K \notin [BA]$ );
9. The remainder of  $1932 \div 17$  is 11, the remainder of  $261 \div 17$  is 6. Is  $2193 = 1932 + 261$  divisible by 17? Can you tell without calculating?
10. Find all natural numbers such that upon division by 5 they give equal quotient and remainder.
11. Even or odd number will be the sum and the product of
- 2 odd numbers
  - 2 even numbers
  - 1 even and 1 odd number
  - 1 odd and 1 even number
- Can you explain why?

12. There are red, green, and blue pencils in the box, 20 pencils altogether. There are 6 times as many blue pencils as the green ones, there are fewer red pencils than blue pencils. How many red, green, and blue pencils are there in the box?
13. There are red and blue balloons in the room, 85 balloons altogether. At least one of them is red. In any random pair of the balloons at least one is blue. How many red and how many blue balloons are there in the room?
14. Rewrite the expression as a sum and compute  
*Example:*  $10 - 3 - 6 = 10 + (-3) + (-6) = 1$
- a)  $18 - 12 - 26$ ;  
b)  $-13 - 8 + 13$ ;  
c)  $-14 - 7 + 9$ ;  
d)  $7 - 12 - 8$ ;
15. Will the product of 2 consecutive natural numbers be divisible by 2? Why?
16. \* Will the product of 3 consecutive natural numbers be divisible by 3, by 6? Why?
17. Copy the pictures below to your notebook. Use compass and ruler.

