Yellow Level

1. (5 credits) The perimeter of the square was increased by 5 percent. By how many percent did its area increase?

2. (5 credits) Each of the six members of the team was solving 9 problems. 2 hours later the members found that each of them solved 2 problems. A problem was considered solved if it was solved by three members. What could be the minimum number of the problems unsolved by the team?

3. (6 credits) A block of sheets fell out of the book having pages with standard pagination. Page 12 was on the first sheet of the block, and page 67 was on its last sheet. How many sheets fell out of the book?

4. (8 credits) Solve the equation system $a^2+2b=-1$; $b^2-2a=-1$.

5. (10 credits) Santa Claus put 13 chocolates in each of his Christmas gift boxes, but the remaining number of his chocolates was less than needed for the last gift box. When he began to put 15 chocolates instead of 13 ones in each gift box, all his chocolates happened to be distributed in the same gift boxes. What is the maximum number of the chocolates that Santa Claus could have?

6. (12 credits) A computer game player can score 8, 9 or 19 points at each level (depending on his success at that level). What is the maximum natural number of points that cannot be scored in this game?

7. (12 credits) The point O is inside the equilateral triangle ABC. It is known that $\angle AOB=112°$, $\angle BOC=123°$ and $\angle COA=125°$. Find all angles of the triangle having sides equal to AO, BO and CO.

8. (12 credits) Petya tries to find grid rectangles, diagonals of which cross exactly 23 squares. He has already found 1×23 and 23×23 rectangles. How many more such rectangles can he find (a×b and b×a rectangles are assumed to be identical)?

9. (15 credits) The length of the edge of the cube $ABCDA_1B_1C_1D_1$ is 8. The edges AB and CC_1 are connected by all possible line segments. Midpoints of the segments form a plane figure. What is the area of this figure?

10. (15 credits) Specify the fractions of type 1/A and 1/B (A and B are natural numbers) the difference of which is 4/221.