Yellow Level

1. **(6 credits)** What is the maximum number of sides of a figure that is a common part of a triangle and a convex quadrangle? Give an example, please.

2. **(6 credits)** Winnie-the-Pooh's barrel contained 22 kg of honey and N kg of peanut butter. After adding 15 kg of peanut butter to the barrel, its content in the barrel increased by 33%. What is N?

3. **(8 credits)** We found two divisors of 160 000. Their sum was equal to 1025. What was the larger of these divisors? Find all possible options.

4. **(8 credits)** Find the numerical value of $(\sqrt{12}+5\sqrt{3})(\sqrt{578}-3\sqrt{8})\cdot\sqrt{6}$.

5. **(8 credits)** Let a natural number be called a 'number of interest', if for any natural k meeting the conditions $1 < k < 8$ either this number is divisible by k, or its digits can be rearranged so that the resulting number will be divisible by k. Find the smallest number of interest.

6. **(10 credits)** In a right triangle, the sum of its sides is 70 and the sum of the squares of its sides is 1682. Find the square of the difference of its legs.

7. **(12 credits)** Each cell of a 7×7 table contains a natural number. In any 1×3 or 3×1 part of this table, the sum of numbers contained in its cells is 7. Can the sum of all numbers contained in the table be equal to 120?

8. **(12 credits)** There are several rooks on the chessboard. A study composer wants to paint each rook any of N colours to avoid the situation when two rooks of the same colour can take each other. What is the smallest N meeting such conditions for any arrangement of the rooks? Any rooks cannot take each other if a rook of other colour is placed between them.

9. **(15 credits)** 100 men sat at the Round Table, Each of them is either a knight who always tells the truth, or a knave who always lies. 28 of them gave a positive answer to the question 'Is the neighbour to your left a knight'. What was the maximum number of liars sitting at the Round Table?

10. **(15 credits)** Kai divided a 10×10 square ice plate into 3 parts and calculated the perimeter of each part. All perimeters were equal to N. What is the maximum possible N?