White Difficulty Level MathCat

Problem 1. (5 credits) Christopher Robin has five toys in a row on his shelf: a pony, a robot, a turtle, a hare, and a bear. There are no animals near the hare, the turtle is in the far right of the row, and there is exactly one toy between the robot and the pony. What is the order of the toys on the shelf (from left to right)?

Problem 2. (6 credits) The following animals want to play football: 9 dogs, 13 geese, 4 giraffes, 2 kangaroos, and 5 mice. How many ostriches they need to form 6 teams with an equal number of bipeds and quadrupeds in each team?

Problem 3. (8 credits) There were 9 employees in the purchasing department, their average age was 23. The department began recruiting applicants for positions subject to a probationary period. 11 candidates with an average age of 21 applied in total. When 6 of them were accepted, the average age of the remaining candidates changed to 27.6. What is the average age of all employees and candidates accepted in the purchasing department now?

Problem 4. (8 credits) A piece of chalk is a rectangular bar. Pupils use the same amount of chalk during each lesson. After 33 lessons, the piece has shrunk to exactly half its length, half its height, and a third its width. How many more lessons can the remaining piece of chalk be used for with the same consumption?

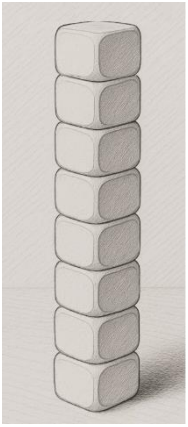

Figure 1

Problem 5. (10 credits) The faces of a dice are numbered from 1 to 6 (all numbers are different), and the sum of the numbers on opposite faces is 7. Ann glued 8 such identical dice together to form a stack (see Fig. 1). What is the minimum sum of the numbers on all the unglued faces of the stack?

Problem 6. (10 credits). Figure 2 shows a square with an area of 10. One of its diagonals is divided into three equal parts. The rhombus is drawn so that one diagonal of the square and the middle third of its other diagonal are diagonals of this rhombus. What is the area of this rhombus?

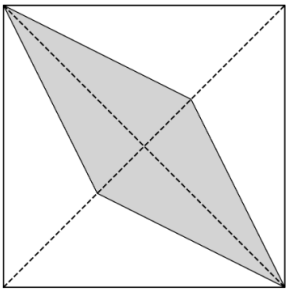

Figure 2

Problem 7. (10 credits) Robin Hood threw darts at a dart target. He started with 3 darts. For hitting zones 9 or 10 of the target, he received 5 extra darts; for hitting zones 7 or 8, he received 3 extra darts; for hitting any other zones or missing, he received no darts. How many times did he hit zones 9 or 10 if he run out of darts after 22 throws?

Problem 8. (12 credits) Twenty-three teams took part in the quiz. They were divided into three groups: two groups included eight teams, and a third group included seven teams. Each game involved two teams. Each team played only one game against every other team in its group. Then two teams from each group advanced to the final. In the final, each of these teams played only one game against every other finalist. How many games did all teams play in the quiz?

Problem 9. (14 credits) A teacher drew a convex polygon and all its diagonals. The total number of the diagonals was 90. How many angles does this polygon have?

Problem 10. (17 credits) The natural number x ends in 9 and has 12 distinct divisors (including 1 and the number itself). How many distinct divisors does the number 100x have?