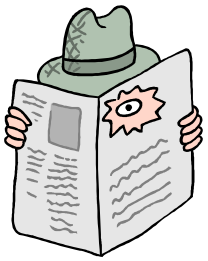
Intermediate Circle 1, Problem Set 12

Jan 9th, 2017

1. Find a two-digit number that is 3 times bigger than the sum of its digits.

2. A poll of 200 people showed that 13% of them liked red color. 65% of people liked one of the primary colors (red, green, and blue). What percent of people, who preferred primary colors, liked red?



3. "I will never tell you my secret 4-digit code, Arthur," Peter said. "I have chosen it since it is symmetrical, and the sum of its digits is the same as the number formed by the first two digits."

   "Now I am definitely able to use your code, Peter. You will have to think of a new one," Arthur replied. Do *you* know Peter's secret code?

4. In the 100-digit number 12345678901234…7890 Ben crosses out all digits that are located at odd-numbered positions. From the 50-digit number that is left he crosses our all digits that are located at the odd-numbered positions. He keeps doing so until he ends up with a single-digit number. What is this number?

5. Kirill came to Philip's birthday party. In the hall, he saw the guests' coats hanging on the wall in a row, 20 coats total. While everyone was playing videogames, Kirill entertained himself by repeatedly choosing some two coats one apart from each other and switching their places. Could it be that when the guests prepared to leave, the coats were hanging in the reverse order?

Challenge:

6. A six-digit number starts with 7. If we remove it, and write 7 at the end of the number instead, the number will become 5 times smaller. What was the original number?