1   In a coordinate system, a circle with radius 7 and center is on the y-axis placed inside the parabola with equation $y = x^2$, so that it just touches the parabola in two points. Determine the coordinate set for the center of the circle.

2   A fisherman has caught a number of fish. The three heaviest together make up 35% of the total weight of the catch. He sells them. After that, the three lightest make up together $5/13$ of the weight of the rest. How many fish did he catch?

3   A function f satisfies

$$f(x) + xf(1 - x) = x$$

for all real numbers x. Determine the number $f(2)$. Find f .

4   Nanna and Sofie move in the same direction along two parallel paths, which are 200 meters apart. Nanna's speed is 3 meters per second, Sofie's only 1 meter per second. A tall, cylindrical building with a diameter of 100 meters is located in the middle between the two paths. Since the building first once the line of sight breaks between the girls, their distance between them is 200 metres. How long will it be before the two girls see each other again?

5   Is there a number whose digits are only 1's and which is divided by 1999?