Question 1
Starting with a positive integer \( n \), form the sum of decimal digits of \( n \), then form the sum of digits of this new number and so on, until the process stabilizes. The result is called the **ultimate digital sum** of \( n \). How many integers in the range 1, 2, 3, ..., 2012 have ultimate digital sum equal to 7?

Question 2
George Orwell’s novel “1984” begins

> It was a bright cold day in April and the clocks were striking thirteen.

The year 1984 is unusual in that there were 5 Wednesdays in February, and exactly three Friday the 13ths in the year, the maximum possible. What is the next such year?

Question 3
How many positive integer solutions \( x \) and \( y \) are there of the equation \( x^2 - y^2 = 75 \)?

Question 4
The planet Snork is populated by 2 alien species: the Zorks, who always tell the truth, and the Gorks, who always lie. Unfortunately to human eyes the two species look identical.

On the planet you meet 3 aliens: Alt, Balt and Calt. Alt and Balt make the following statements:

- Alt: Balt and Calt are the same species.
- Balt: At least one of Alt and Calt is a Gork.

Which species is Calt?

Question 5
A smaller square is placed inside a larger square. The sides of the two squares are parallel. If the areas marked are as shown, what is the area \( A \)?