Maths Challenge - Week 298 – Problems

Welcome to week 298 of our weekly maths challenge, with problems and puzzles posed by David Browning, Rod Marshall, Ian Stewart, Annie Stothers and the u3a Maths and Stats Subject Adviser - David Martin. If you would like to share your ideas on how to solve these puzzles please join our learning forum or discuss within your u3a and interest group. Check back each week for the solutions and let us know how you get on by contacting the u3a office. New maths puzzles will go up onto the website every Thursday.

Question 1.

Find a two-digit number such that:

- The sum of its digits is **10**
- Reversing the digits increases the number by **36**

Question 2.

Two fair six-sided dice are thrown. What is the probability that the sum is a multiple of 3?

Question 3.

A set of real numbers {a, b, c, d} satisfies the following equations:

(1) $a + b + c = 2$

(2) $a^2 + bc = 1$

(3) $a(b + c) = d^2 + 1$

Find all possible values for the set of numbers.

Question 4.

Starting with a number, add 4, then calculate the positive square root of the result and add 10, then multiply the result by 13 and then subtract 20. If the final result is the same as the starting number, what is that number?