Question 1

This is the first question.

Question 2

This is the second question. It has some parts.

Part A

This is the first part, where we compute a solution to $x^2 - 4x + 3 = 0$ using the quadratic formula and a long computation.

$$\begin{aligned} x &= \frac{4 \pm \sqrt{(-4)^2 - 4 \cdot 1 \cdot 3}}{2 \cdot 1} \\ &= \frac{4 \pm \sqrt{16 - 12}}{2} \\ &= 2 \pm 1. \end{aligned}$$

We conclude that the solutions are $x \in \{1, 3\}$. Note that all solutions are elements of $\mathbb{R}$, that is, the real numbers: $\mathrm{Im}(x) = 0$.

Part B

Here is another subsection where we don't do anything fancy. You can find more information than you ever wanted about how to use LaTeX at `https://tobi.oetiker.ch/lshort/lshort.pdf`.

Question 3

Claim. *There are infinitely many prime numbers.*

Proof. Left as an exercise to the reader. □