# Analysis of Dynamical Systems

## Variant 3

### Part 1: Brusselator

Analyse 2-D system.

$$\begin{cases} \dot{x} = a - x - bx + x^2 y, \\ \dot{y} = bx - x^2 y, \end{cases}$$

where $a$ and $b > 0$ are constants.

| Parameter | version **3.1** | version **3.2** |
|---|---|---|
| $a$ | 0.4 | 1.0 |
| $b$ | 1.2 | 1.7 |

### Part 2: Newton–Leipnik chaotic system

Determine whether the following 3-D system represents a strange attractor or not.

$$\begin{cases} \dot{x} = -ax + y + 10yz, \\ \dot{y} = -x - 0.4y + 5xz, \\ \dot{z} = bz - 5xy, \end{cases}$$

where $a$, $b > 0$ and $a = 0.4$ and $b = 0.175$.