Analysis of Dynamical Systems

Variant 9

Part 1: Forced Van der Pol oscillator

Analyse 2-D system.

$$\ddot{x} - b\left(1 - x^2\right)\dot{x} + x = F\cos(\omega t),$$

where b, F, and ω are constants.

Parameter	Version **9.1**	Version **9.2**
b	5	1
F	4	2
ω	3.717	6.171

Part 2: Sprott C, chaotic flow

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

$$\begin{cases} \dot{x} = yz, \\ \dot{y} = x - y, \\ \dot{z} = 1 - x^2. \end{cases}$$