Van der Pol function :

$$\frac{d^2x(t)}{dt^2} + \mu\left([x(t)]^2 - 1\right)\frac{dx(t)}{dt} + x(t) = 0$$

(sebuah pers. diff order kedua)

Misalkan :

$$x(t) = x_1$$

$$\frac{dx(t)}{dt} = x_2 = \frac{dx_1}{dt}$$

$$\frac{d^2x(t)}{dt^2} = \frac{dx_2}{dt} = -\mu\left([x(t)]^2 - 1\right)\frac{dx(t)}{dt} - x(t)$$

$$= -\mu\left(x_1^2 - 1\right)x_2 - x_1$$

2 (dua) buah pers diff. order pertama :

$$\frac{dx_1}{dt} = x_2 \quad \text{---------- (1)}$$

$$\frac{dx_2}{dt} = -\mu\left(x_1^2 - 1\right)x_2 - x_1 \quad \text{-- (2)}$$