Mathematica for physicists - Exercise 2

Due to 07/04/2019

Exercise 1

We have started in class solving the equation:

$$\frac{\partial^2}{\partial t^2} y(t) + \omega^2 y(t) + \alpha_2 y^2(t) + \alpha_3 y^3(t) = 0, \tag{1}$$

by an expansion of the form:

$$y(t) = \sum_{n=1}^{N} \epsilon^n x_n(t). \tag{2}$$

Solve the equation up to $x_3(t)$ and show that $x_3(t)$ divergence linearly with time and explain the result. Use the attached Mathematica file.