1 differential equation

lets consider a 2nd degree ordinary differential equation

$$\ddot{\theta} \quad = \quad f(\dot{\theta}, \theta)$$

We can approximate solutions to this equation as follows for $n \in [0, \infty[$:

$$\theta_n \quad \approx \quad \theta_{n-1} + \dot{\theta}_{n-1}\Delta t$$

$$\dot{\theta}_n \quad \approx \quad \dot{\theta}_{n-1} + \ddot{\theta}_{n-1}\Delta t$$

$$\ddot{\theta}_n \quad = \quad f(\dot{\theta}_n, \theta_n)$$

The smaller the time interval Δt, the more accurate the approximation should be.

We just need initial conditions for θ_0 and $\dot{\theta}_0$ and then we can start with the algorithm.