

Intro

Tuesday, March 9, 2021 8:58 AM

Many engineering & physics questions can be expressed by ODEs

- Springs
- Pendulum
- Temperature
- Predator-Prey & many more

ex/ You are measuring concentration of drug in the bloodstream, $C(t)$, as the body metabolizes it. The drug decays at a rate proportional to current concentration.

$$\frac{dc}{dt} = -k C(t) \quad \leftarrow \text{Diff Eq.}$$

$\frac{dc}{dt}$: rate of change of concentration of drug
 $-$: decay not growing
 k : constant
 $C(t)$: concentration of drug at time t .

$$C(0) = 100 \text{ mg/L} \quad \leftarrow \text{initial condition}$$

This is an example of an ODE that we can solve.

But often we can't solve analytically, need numerical methods to approximate solution.