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# Application of ODEs

- 1) Newton's law of cooling
- 2) Beam
- 3) Physical Application
- 4) Radio Active Element
- 5) Electrical circuits
- 6) Modelling free mechanical oscillations
- 7) No Damping
- 8) Light Damping
- 9) Heavy Damping
- 10) Modelling Forced mechanical oscillations

- 11) Computer <sup>(2)</sup> Exercise or activity
- 12) Modelling with first order Equations

# Application of PDE

Partial differential equations

In many engineering or science problems, such as heat transfer, elasticity, quantum mechanics, water flow and others the problems are governed by partial differential equation. By nature, this type of problem is much more complicated than the previous ordinary differential equations.

There are several major methods for the solution of PDE

- 1) Separation of Variables
- 2) Method of Characteristics,
- 3) Integral transform,
- 4) Superposition principle,
- 5) Change of Variables,
- 6) Lie group method
- 7) Semianalytical method  
as well as various  
numerical methods