

Goal and idea - Module 8

GOAL:

We turn the page and consider higher order differential equations. We note, however:

- With first-order DEs, we were able to look at many different types (including nonlinear DEs!).
- With higher order DEs, we restrict our attention only to *linear* differential equations.

In this module, we begin studying higher order linear DEs by

- recalling their definition,
- defining what homogeneous and inhomogeneous linear differential equations are (different homogeneous than before!), and
- learning how to determine whether we are *guaranteed* existence (and uniqueness!) of a solution for a given higher order linear IVP.

IDEA:

We increase our scope of DEs by considering higher order DEs, but restrict or scope by only looking at linear DEs. We make a key classification between such DEs that don't have terms attached to the dependent variable or its derivatives (homogeneous DEs) and those that do (nonhomogeneous DEs). Finally, we raise the question of whether there exists solutions for an IVP (and if so, how many?).