Goal and idea - Module 17

GOAL:

It is not uncommon to want to find multiple functions which *simultaneously* solve multiple differential equations. In other words, we may want to find solutions for a *system of differential equations*. As most of our recent knowledge centers around linear differential equations, we look at what a theory of systems of linear differential equations would look like. In particular, we

- define what systems of linear differential equations are, as well as IVPs in this setting;
- find how to verify if a given *vector* is a solution to a system if differential equations;
- learn when a unique solution to an IVP exists;
- learn what constitutes a fundamental set of solutions and a general solution for systems of linear differential equations; and
- solve systems of homogeneous linear differential equations!

IDEA:

We essentially translate the theory we have seen before to the word of matrices and vectors!