# Ordinary Differential Equations - Check your knowledge

□ Do you know how to decide whether a function is a solution to a differential equation?

□ Do you know how to find a solution to a differential equation that satisfies given initial or boundary conditions?

□ Do you know how to decide whether a differential equation is linear? Same question with a system of differential equations.

□ Do you know how to turn a differential equation of order $n$ into a first order system of $n$ differential equations?

□ What does the general theorem of existence and uniqueness say? How is this theorem modified in the case of a linear system of equations?

□ Do you know what it means for a set of functions to be linearly independent?

□ What is the Wronskian of a set of functions? How do you calculate it?

□ What is the Wronskian of $n$ $n$-dimensional vectors whose components are functions?

□ How do we find a basis of the set of solutions to a homogeneous linear differential equation with constant coefficients?

□ How do we find a basis of the set of solutions to a homogeneous first order system of linear differential equations?

□ What is the general form of the solution to a non-homogeneous linear differential equation, or to a non-homogeneous first order system of differential equations?

□ What methods do you know to find particular solutions to linear differential equations? For what type of equations do they work?