

Math 2C03: Quiz #3 Information

QUIZ: MONDAY, JULY 13TH, 7PM (FIRST 10 MINUTES OF CLASS)
McMaster University

Potential Quiz Questions:

Your quiz on Monday will consist of one or two of the questions listed below.

- State the Existence/Uniqueness Theorem for n^{th} -order linear initial value problems.
 - Consider the differential equation $(x^2 - 1)y'' + 3xy' + \cos(x)y = e^t$. Give a set of initial conditions and an interval where the solution is guaranteed to be unique.
 - Give a set of initial conditions for $(x^2 - 1)y'' + 3xy' + \cos(x)y = e^t$ where the assumptions of the theorem fail. What does this tell us about existence/uniqueness?
- What is a *fundamental set of solutions*?
 - Suppose f_1 , f_2 , and f_3 are solutions to a second-order linear homogeneous differential equation. Is $\{f_1, f_2, f_3\}$ a fundamental set of solutions? Why or why not?
- Give an example of two functions which are linearly independent. Explain why they're linearly independent.
 - Give an example of two function which are linearly dependent. Explain why they're linearly dependent.
- Suppose you're given a third-order linear homogeneous differential equation with constant coefficients and its auxiliary equation has one distinct real root and a pair of complex roots. What must its general solution look like?
- Which types of equations can be solved using undetermined coefficients (annihilator approach)?
- Describe how you would find the general solution to a Cauchy-Euler equation.