

Third Exam

Thursday, November 21

This exam is open book, computer on. Make sure your name is on all pages, and put your name in a text cell on any Mathematica notebooks before you print them.

1. Solve the following initial value problem by hand. Show all steps.

$$y''' + y' = 0, \quad y(0) = 1, \quad y'(0) = 0, \quad y''(0) = 0.$$

Check your solution with `DSolve` from Mathematica.

2. Using hand calculations, find terms in the Taylor polynomial expansion up to and including degree 4 to the solution to the following initial value problem.

$$y''(t) + ty'(t) + ty(t) = e^t, \quad y(0) = 0, \quad y'(0) = 0.$$

Check your result with `Series` and `Solve` from Mathematica.