Differential Equations - Advanced Problem Set 7

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Directions: Do the following book problems

Chapter 8.1 Problems 27.
Chapter 8.2 Problem 28, 34

Other Notes:

1. Number 27 is asking you to solve the problem two ways: First use power series to show that the solution is $y = f(x)$, then use characteristic equations to find $y = f(x)$ which should be an analytic function. NOTE: I used Sympy to take the derivatives and Numpy to solve the linear system since doing it by had was annoying. I also used python to calculate the final answer: The series converges to 1.7015655.

2. Number 34 is basically doing what we did for Legendre Polynomials. You solve the ODE using power series method and define the resulting functions as Airy functions. You should either look up graphs of these online, or better yet, see if you can graph them using Sympy!