Agenda for We, March 17, 2021

- Exam 5 info: Friday, over 5.1–5.4
- Questions
- Review:
  - 5.3 #16 (started on Monday)
  - Identify function from power series DEPoll
  - Exam 5, Question 6 look-alike.

Info on Exam 6

60 minutes, 6 questions. In order of appearance:

a. General solution of Euler's equation.

b. Rewrite as a single power series

c. Solve a recurrence relation and recognize the function from its power series.

d. Find a series solution for first order non-homogeneous equation like in Section 5.3 #16.

e. Values of $y''(0), y'''(0), y^{(4)}(0)$

f. Recurrence relation for the coefficients of the power series

g. Determine the first **eight terms** in the series expansion of the solution of DE

h. Compute Wronskian of y_1, y_2 (from power series)

Omitted topic: radius of convergence for y.

Series solutions near ordinary point

Steps

1. Write the series expansions for y, y', y'' and for all other expressions that appear in the equation, like x^2y, xy', x^2y'', e^x, etc.
2. Determine the recurrence for the coefficients of the power series.
3. Determine the initial coefficients

$$a_0, a_1, a_2, a_3, a_4, a_5, a_6, a_7, \ldots$$

   until you notice the pattern.
4. Write down the formula for a_n.
5. Write your answer as the power series.
6. Identify the formula for $y(x)$, if possible.