

Math 3413.001: Physical Mathematics I

Homework 4, due February 18 (Tuesday)

Lecture 7 (Feb 4) - Due date 02/18/2020 : Section 3.3

1. Find the general solution of the differential equation
 - (a) $y'' - 2y' + 4y = 0$.
 - (b) $y''' + 8y = 0$.
 - (c) $y^{(4)} - 81y = 0$.
2. Find the general solution of the linear homogeneous differential equation with constant coefficients whose characteristic equation factors as follows.

$$r^3(r+3)^2(r^2+9)^2(r-5)(r^2-2r+4) = 0.$$

3. Suppose

$$y(x) = c_1 + c_2x + (c_3 + c_4x)e^x + (c_5 \cos(2x) + c_6 \sin(2x)) + x((c_7 \cos(2x) + c_8 \sin(2x)))$$

is a solution to a linear homogeneous differential equation with constant coefficients. Find the differential equation.

Suggested problems from the book (DO NOT SUBMIT): Pg 170-172, #12, 15, 18, 29, 34, 40