

Math 222, Spring 2016

Present your work in an organized fashion. Make sure that your work is algebraically correct and logically sound. Show all your work. Discussion (if necessary) with others is encouraged, while copying other's solution is a violation of NJIT student honor code. Do not forget that you should also be able to do (but not hand in) the homework problems listed on the syllabus.

Homework Problems for Week 4

1. Consider the equation $x^2y'' - 4xy' + 6y = 0$ on $(-\infty, \infty)$
 - a) Verify that $y_1 = x^3$ and $y_2 = |x|^3$ are linearly independent solutions of the equation on the interval $(-\infty, \infty)$.
 - b) Show that $W(y_1, y_2) = 0$ for every real x . Does this result violate theorem 3.2.4? Explain.
 - c) Verify that $Y_1 = x^2$ and $Y_2 = x^3$ are linearly independent solutions of the equation on the interval $(-\infty, \infty)$.
 - d) Both combinations $C_1y_1 + C_2y_2$ and $B_1Y_1 + B_2Y_2$ are solutions of the given equation. (Why? Explain.) Discuss whether one, both or neither of these combinations is a general solution of the equation on $(-\infty, \infty)$.
2. Find a second order linear equation with constant coefficients that has a solution $y = e^x \cos 3x$.