HOMEWORK #4 (Chapter 3 Exercises--- Preliminary Theory, Reduction of Order, Homogeneous Linear Equations with Constant Coefficients)

Due on Nov. 2

Consider 1), 2), determine whether the given set of function is linearly dependent or linearly independent on the interval $(-\infty, \infty)$.

1) $f_1(x) = x,\ f_2(x) = x^2,\ f_3(x) = 4x - 3x^2$ (page 113, Problem 15)

2) $f_1(x) = 1 + x,\ f_2(x) = x,\ f_3(x) = x^2$ (page 113, Problem 21)

3) Verify that the given function form a fundamental set of the differential equation on the indicated interval. Form the general solution. $x^2y'' - 6xy' + 12y = 0;\ x^3, x^4, (0, \infty)$

(page113, problem 27)

Consider 4)~ 5), the indicated function y_1 is a solution of the given equation. Use reduction of order to find a second solution y_2.

4) $9y'' - 12y' + 4y = 0;\ y_1 = e^{2x/3}$ (page 116, Problem 7)

5) $x^2y'' - 7xy' + 16y = 0;\ y_1 = x^4$ (page 116, Problem 9)

Consider 6)~ 7), find the general solution of the given second-order differential equation.

6) $y'' - y' - 6y = 0$

(page 122, Problem 3)

7) $y'' + 8y' + 16y = 0$

(page 122, Problem 5)