

**1 Variation of parameters:**

Solve the following DE's by the method of variation of parameters (see lecture note), using the given solutions of the homogeneous equation.

a)  $x^2 y'' - 2xy' + 2y = x \ln x$ ;  $y_1 = x$ ,  $y_2 = x^2$

b)  $(x^2 + 1)y'' - 2xy' + 2y = (x^2 + 1)^2$ ;  $y_1 = x$ ,  $y_2 = 1 - x^2$

**2 Series expansion methods:**

a) Boas chapter 12 problem 1.8

b) Boas chapter 12 problem 11.2

c) Boas chapter 12 problem 11.6

d) Boas chapter 12 problem 11.10