

First Semester 2002/2003
MATHS 205
Test II

Q1. Find the form only of the particular solution of the following equations:

(a) $y'' + 3y' = 2x^4 + x^2 e^{-3x} + \sin 3x$.

(b) $y'' + 2y' + 5y = 3x e^{-x} \cos 2x - 2x e^{-2x} \cos x$

Q2. (a) Find a second independent solution for the equation

$$x^2 y'' + xy' + \left(x^2 - \frac{1}{4}\right)y = 0, \quad x > 0;$$

where $y_1 = x^{-1/2} \sin x$

(b) Use Abel's formula to find the wronskian $w(y_1, y_2)(x)$ for the above equation.

Q3. Solve the following two equations:

(a) $y''' - 3y'' + 3y' - y = 0$;

(b) $x^3 y''' - 3x^2 y'' + 6x y' - 6y = 0, \quad x > 0$.