10720EECS203002

Ordinary Differential Equation 1st Midterm Exam – **Home Test**

姓名： 學號：

First order ODE

1：$y' + 2y = x \sin x$ (10%)

2：$y' + 2y = e^{-2x} \tan x$ (10%)

Second order ODE

(Non-homogeneous)

3：$y'' + 2y' + y = e^{-4x}$ (10%)

4：$y'' + 3y' + 2y = e^{-x}$ (10%)

5：$y'' + 2y' + y = e^{-x}$ (10%)

(Cauchy equation)

6：$x^2 y'' + xy' + y = 4 \sin(\ln x)$ (10%)

(Taylor)

7：$(1 - x^2)y'' - 2xy' + 12y = 0$, $-1 \le x \le 1$ (10%)

8：$y'' + xy = 0$ (10%)

(Frobenius)

9：$x^2 y'' - (x^2 + x)y' + y = 0$ (10%)

10：$x^2 y'' + xy' + (x^2 - u^2)y = 0$, $0 \le x \le R$, $u = 0,1,2,3 \ldots$ (10%)