Norwegian University of Science and Technology
Departement of Mathematical Sciences

TMA4110 Calculus 3 Autumn 2010

Exercise set 3 – Week 37

Kreyszig (9th. edition) section 2.4

1,6,14

Kreyszig (9th edition) section 2.5

1,11

Kreyszig (9th edition) section 2.6

4,8,13

Multiple-choice questions

1 The differential equation $x^2y'' - 5xy' + by = 0$, $x > 0$, where b is a real number, has two linearly independent solutions $y_1 = x^4$ and $y_2 = x^m$. Find m.

A: $m = 1$ **B:** $m = 2$ **C:** $m = -3$ **D:** $m = -9$

2 Which pair of functions $y_1(x), y_2(x)$ *cannot* be linearly independent solutions of a second-order linear homogeneous differential equation $y'' + p(x)y' + q(x)y = 0$ on the interval $(-1, 1)$?

A: $y_1 = x$, $y_2 = x^2$ **B:** $y_1 = e^{-x}$, $y_2 = e^{2x}$ **C:** $y_1 = 1$, $y_2 = x$ **D:** $y_1 = e^x \cos x$, $y_2 = e^x \sin x$