Mathematics 304 – Ordinary Differential Equations
Review Sheet – Exam 2
November 8, 2000

General Information

The second midterm exam this semester will be given in class on Thursday, November 16, as announced in the class last week. This will be an *open-book* exam, and you may use calculators at any point. The reason for this is the relatively complicated forms of particular solutions for inhomogeneous second order linear ODE from section 4.8. *Be well prepared on that and the other topics below, though. You will not have enough time to complete the exam if you need to look everything up in the text!*

The exam will cover the material from Chapters 4 and 5 of the text that we have studied since the first midterm (see specific topics and review problems below).

If there is interest, I would be happy to arrange a late afternoon or evening review session for the exam. Tuesday, November 14 is probably the best day to aim for.

Topics To Be Included

1) The theory of second order linear ODE: the existence and uniqueness theorem for solutions, fundamental sets of solutions for homogeneous equations, the Wronskian and Abel's identity, general solutions of inhomogeneous equations.
2) The constant coefficient case – the auxiliary equation, forms for solutions when the roots are real or complex.
3) Superposition and the method of undetermined coefficients for inhomogeneous equations.
4) First order systems – critical points and their classification, the phase plane, trajectories and integral curves.

Suggested Review Problems

From §4.2: 1-10, 19-22

From §4.3: 7-13, 15, 19, 26

From §4.5: problems like 13-20, 39-42,

From §4.6: problems like 21-28

From §4.7: 13, 14

From §4.8: problems like 25-32, 58, 59

From §4.10: 3-6

From §4.12: 3, 5

From §5.2: problems like 1 - 24, 29, 35a,b,c