MATH 242 University of South Carolina
D. Meade Spring 1995

Homework Problems for Chapter 1

Due: the class meeting following discussion in class

Section	Page	Problems
1.1	4	# 1, 6, 7, 12, 16
1.2	12	# 3, 6, 11, 21, 22
1.3	19	# 4, 5, 10, 11, 22

Notes

- Read these directions! The additional comments, suggestions, and revisions some problems should help you to improve your understanding the material and your time management.
- The skills required in these problems: classification of differential equations, checking that a function satisfies a differential equation, finding solutions to initial value problems, and writing differential equations that model a given situation will be used repeatedly during the course.
- The assigned problems should be considered the minimum set of problems that you should work. There are many good problems in the text. If you feel the need for more practice, choose problems similar to the ones already assigned. This is particularly useful when studying for an exam. (Don't be surprised if several problems from the book appear on exams.)
- The problems in Section 1.1 emphasize the fundamental terminology of differential equations. It's not important for you to understand where the equations originated, we will return to this later in the semester. The last two problems ask you to formulate a differential equation based on a written description of a physical law. This is an important skill that we will continue to develop throughout the course.
- The second set of problems, from Section 1.2, illustrate some of the different types of solutions that are encountered in differential equations. Don't worry about how these solutions were found; we'll come to this soon enough. Be sure you can work these problems by hand, but also note how they can be solved using Maple.
- The last section in Chapter 1 provides a general method for looking at a first-order ODE in the form $y'(x) = f(x, y(x))$. The key is to recall that the differential equation provides information about the rate of change of the unknown function; this is the information plotted in a direction field.

  Do not use the method of isoclines for problems 1–6. Use Maple to draw the direction fields. For problems 9–22 you are encouraged to turn in a Maple worksheet (just a printed copy, there's no need to e-mail it to me). You may find the `euler.ms` worksheet of use here.