

Math 3113 homework

1. (assigned 1/19) Study the course syllabus. Make sure you know the meaning of the following terms: equation, differential equation, ordinary differential equation, partial differential equation, order of a DE, one-parameter family. Read some math and think carefully about the types of objects that each symbol represents. Problems: 1.1 # 2, 3, 7, 11
2. (assigned 1/21) 1.1 # 15 (Find more solutions, too, like we did in class), 17, 19 (Notice that for this problem, $2y(x)$ is not a solution to the DE... even though $y(x)$ is. Why doesn't our method for generating more solutions work this time?), 25 (Do you need to review your trig derivatives?), 27, 28, 37 (Find two solutions, then infinitely many more), 42 (Note that this says $y'' = -y$, what basic functions satisfy that?)
3. (assigned 1/21) As many as needed of 1.2 # 1-18.
4. (assigned 1/24) A couple of 1.3# 1-10, just to get the idea.
5. (assigned 1/24) 1.3# 28, 29
6. (assigned 1/24) Take a quick look at some of 1.3# 11-20. Their purpose is to help you understand the statement of the Existence and Uniqueness Theorem. We will discuss it more and do a problem like these in class Wednesday, but give these a try.
7. (assigned 1/26) 1.4 # 3, 5 (you will need to use the inverse sine function $\sin^{-1}(y)$), 17, 21, 24, 27, and as many more from # 1-28 as you need to master the basic method of separation of variables.
8. (assigned 1/28) Be fully caught up on Sections 1.1 through 1.4, so that you are ready to go on Section 1.5. Look over Section 1.5 a bit, and be sure you know the exact meaning of *first-order linear* DE and *homogeneous* first-order linear DE. Know how to solve $y' = P(x)y$ (make up a few of your own examples of this form and solve them).
9. (assigned 1/31) As many as you need of 1.5 # 1-25 to master the recipe for first-order linear DE's. Do at least # 9, 15, 16, 19, and 24.
10. (assigned 1/31) 1.5 # 34, 36. Note that these are very similar to examples in Section 1.5.
11. (assigned 2/7) 1.6 # As many as you need of 1.6 # 1-30. A few may be hard to see, so don't worry about being able to do every single one, but you should be able to figure out how most of them fall into one of the standard types we discussed, and then carry out the appropriate procedure. Start with # 5, 6, 7, 16, 18, 19, 23, 26, then do however many more you need.
12. (assigned 2/7) 1.6 # 55, 56, 57, 58