Math 300 Assignment 3a

PROBLEMS: 2.50(c), 2.52, 3.27, 3.47, 3.57, 3.64

DR. LOVELESS PROBLEMS

PROBLEM I: Work through each Exam 1 in the exam archive! Make sure you understand all the posted solutions. There are plenty of additional induction problems that you can practice from old exams.

The problems above are DUE NEVER, but you are expected to work through them before Exam 1. Solutions are already online through the homework solutions link (contained in "Extra Chapter 2 Examples", "Extra Chapter 3 Examples" and "HW 3a solutions")

HOMEWORK NOTES/HINTS

• PROBLEM 3.64: Here is the layout of the proof: Give a proof by contradiction. That is, start by assuming there is a statement P(n) such that both the hypotheses of induction are true but the conclusion is false (namely P(n) is not true for some positive integers n). Let S be the set of all positive integers such that P(n) is false. Then use the well ordering principle to say something about this set and find a contradiction with one of the hypotheses of induction. (I've written almost the whole proof here, you just make it look nice and finish it correctly).

Note, this proves that if the well-ordering principle is true, then the principal of mathematical induction is true (you can do an argument in reverse as well, so the two theorems are logically equivalent).

• For more basic induction practice try any (or all) of the following problems:

3.5 - 3.9, 3.14 - 3.19, 3.27 - 3.32, or any induction problems from old exams