Practice Homework #1

‘Due’ Date: February 16th, 2022, in the review sessions

Directions

1. This is an *uncollected, ungraded* homework. The answers to the Rosen text’s questions can be found at the back of the text. (Why aren’t we having a ‘real’ homework over this material? We don’t have time to grade another homework before the final exam.)

2. Even though this is ungraded, the questions cover material that is “fair game” for the upcoming exam. Thus, we strongly recommend that you take them as seriously as you take normal homework questions. That is, write complete answers to all of the questions, do your own work, and show that work, when appropriate.

3. The class staff will be happy to answer your questions about these problems in SI sessions, at the review sessions, during office hours, or via Piazza.

4. **Incentive:** To encourage you to work these problems, one of them will appear on the exam. Assuming that you work these problems – and remember what you did and learned – that exam question will be easy points.

Rules of Inference:

- Section 1.6, 3(a,d).
- Section 1.6, 5.
- Section 1.6, 13(a,d).
- Section 1.6, 15(c,d).
- Section 1.6, 19(all).
- Section 1.6, 23. Note that the ∨ in Line 1 is a typo, not an intentional error!
- Section 1.6, 27.
- Section 1.6, 31.

Direct Proofs:

- Section 1.7, 5. Use a Direct Proof (’cause that’s all we know at this point!)
- Prove, using a Direct Proof, that the sum of any nine consecutive integers is a multiple of nine.
- Prove, using a Direct Proof, that 4 | \((a^3 + b^2 - 1)\), when \(a \in \mathbb{Z}^{even}\) and \(b = a + 1\).
- Section 1.7, 7.
- Section 1.7, 21. See page 88 and Examples 5 and 6.
- Section 1.7, 37. The answer at the back of the book is less than helpful as to why. Here’s a hint: Are the two values for \(x\) both solutions?