WEEK 12

1. Preparation for Assignment

If, and *only if* you can truthfully assert the truthfulness of each statement below are you ready to start the exercises.

1.1. **Reading Comprehension Self-Check.**

- I know in what sense the power of algorithms is limited.
- I know that lower bounds Ω to many problems are known, i.e., no algorithm can undercut them.
- I can give at least two examples of problems with known lower bounds.
- I know that some problems cannot be fully solved.
- I know that there are problems for which algorithms are **not known** to exist.
- I know that there are problems for which algorithms are **known not** to exist.
- I know that many problems are considered intractable, which means infeasible to solve with current technology.
- I know that numerical algorithms face the limiting effects of truncation, roundoff, overflow, underflow and cancellation.

1.2. **Memory Self-Check.** I can, and have, explained to someone who is not a student in the Computer Science and Electrical Engineering or Computer Information Technology departments the difference between problems that are P and NP so that these persons actually understand the difference.

2. Week 12 Exercises

2.1. **Exercise 5 on page 419.**

2.2. **Exercise 10 on page 420.**

2.3. **Not in the Book.** Without doing an approximation, what is the derivative of $y = x^2 + 1$?

2.4. **Not in the Book.** Without doing an approximation, what is the integral of $y = x^2 + 3x + 2$?

3. Week 12 Problems

3.1. **Exercise 6 on page 420.**

Date: July 2, 2020.

3.2. **Exercise 8 on page 420.**