Mathematics 300 Homework, February 4, 2022.

We have the first test next Wednesday. For review start by going over the previous homework assignments. Here are some problems from the text (where there is overlap with previous homework):

- Exercises for Section 1.1, Pages 13–15 Problems: 2, 3ab, 4.
- Exercises for Section 1.2, Pages 27–30 Problems: 1, 2, 7, 11.
- Exercises for Section 2.1, Pages 40–42 Problems: 2, 3, 5, 7, 11.
- Exercises for Section 2.2, Pages 48–51 Problems: 1 (in particular you should know the definitions of **converse** and **contrapositive** 3abc. 10abcd. Also from this section you should know **De Morgan's Laws**:

$$\neg(P \wedge Q) \equiv \neg P \vee \neg Q$$
$$\neg(P \vee Q) \equiv \neg P \wedge \neg P$$

And you should certainly know how to negate an implication:

$$\neg(P \rightarrow Q) \equiv P \wedge \neg Q.$$

- Exercises for Section 2.3, Pages 61–62 Problems: 1, 2, 3.
- Exercises for Section 2.4, Pages 74–76 Problems: 1, 2ab, 3ace
- Exercises for Section 3.1, Pages 96–100 Problems: 1, 3bdef, 5, 7, 8, 10, 11, 12.

Some definition you should know are the definitions on n being either an **even** or **odd** integers. The definition of $a \mid b$ and the definition of $a \equiv b (\text{mod } n)$. There will definitely be proofs involving these on the test.