## **Directions:**

- Print out this piece of paper and use it as a cover sheet. Write your name in the upper right hand corner.
- Your homework should be stapled and each problem should occur in order.
- Do not hand in scratch work.<sup>1</sup> The final version of your solution to each problem should be collocated and stapled.
- Always label every plot (if you have any). For example, you should include titles, x-labels, y-labels, and legends.
- 1. Finish reading Chapter 3, sections 2 through 4. Read Chapter 4, sections 1-3.
- 2. For each of the following quantified statements, i) write them using logical quantifiers, ii) write down the negation of the statement, and iii) determine their truth value.
  - (a) For every  $n, m \in \mathbb{Z}_{>0}$ , we have n = 2m.
  - (b) For every  $n \in \mathbb{Z}_{\geq 0}$ , there exists an  $m \in \mathbb{Z}_{\geq 0}$  such that n = 2m.
  - (c) There exists an  $n \in \mathbb{Z}_{\geq 0}$ , such that for every  $m \in \mathbb{Z}_{\geq 0}$ , we have n = 2m.
  - (d) There exists an  $n, m \in \mathbb{Z}_{>0}$ , such that n = 2m.

*Note:* the set  $\mathbb{Z}_{>0} = \{0, 1, 2, ...\}$  is a subset of the integers.

- 3. Section 2.9: 2.58, 2.59, 2.60, 2.63
- 4. Section 2.10: 2.65, 2.66, 2.68, 2.70, 2.74, 2.78
- 5. Section 3.2: 3.8, 3.9, 3,12
- 6. Section 3.3: 3.16, 3.18, 3.20

<sup>&</sup>lt;sup>1</sup>Yes, doing math will require a lot of scratch work! You will rarely be able to correctly answer each question on your first try. For each problem, figure out what the solution is, and then write-up a *final draft* that you hand in.