

Name and Student ID's: _____

Homework 2, Advanced Calculus 1

1. Rudin Chapter 2, Exercise 3 (see exercise 2 for the definition of algebraic number).
2. Prove that $(-1, 1)$ and \mathbb{R} are in 1-1 correspondence.
3. Rudin Chapter 2, Exercise 11, check $d_1 - d_3$.
4. Rudin Chapter 2, Exercise 11, check d_4, d_5 .
5. For any set A , its *powerset* is defined to be

$$\mathcal{P}(A) := \{E \mid E \subset A\}.$$

Prove that $|A| < |\mathcal{P}(A)|$. That is, there exists an injective map from A to $\mathcal{P}(A)$ but no surjective map.

6. Rudin Chapter 2, Exercise 5.
7. Rudin Chapter 2, Exercise 6.
8. Rudin Chapter 2, Exercise 10.
9. Rudin Chapter 2, Exercise 7.
10. Rudin Chapter 2, Exercise 8.
11. Rudin Chapter 2, Exercise 9.