

Math 311

Project 6 Handout

Due: Wednesday, December 2nd by 4:00pm

Instructions: This project is designed to give you an opportunity to explore some of the concepts from class in a little more depth. You may work with at most one other student on this assignment. If you decide to work with another student, you may turn in a combined paper with both your names listed.

1. (2 points) Prove that (\mathbb{N}, \leq) is a well ordered set.
2. (4 points) Find an order under which \mathbb{Z} is well ordered. Justify your answer. (Hint: The standard order \leq will not work without modification.)
3. (4 points) Find an order under which $\mathbb{Z} \times \mathbb{Z}$ is well ordered. Justify your answer.
4. (4 points) Spend some time researching the Well Ordering Principle. Give a precise statement of this principle. What is known about whether or not the set \mathbb{R} can be well ordered? Be sure to cite the main sources of information you use to complete this portion of the project.