Math 3040 HW 2 - Due Sept. 23, 2019

1. Prove Proposition 2.21 and Corollary 2.22 from TAP
2. Project 2.28 in TAP.
3. Let $(Z, N, +, \cdot)$ be an ordered integral domain. Let $\{x_1, x_2, \ldots, x_n\}$ be a subset of Z. Prove there exists an i, $1 \leq i \leq n$ such that $x_i \geq x_j$ for all $1 \leq j \leq n$. Prove that Z is an infinite set. (Remark: How do you tell if a set is infinite??)
4. Suppose $(Z, +, \cdot)$ is an integral domain. Furthermore, assume that there exists subsets N and N' of Z such that both $(Z, N, +, \cdot)$ and $(Z, N', +, \cdot)$ satisfy all of the axioms of the integers. Prove that $N = N'$.