

Ma 551 Homework 2

Definition Suppose that (A, \preceq) is a well ordered set and that $a \in A$, then $\text{pred}(a, A)$, the set of predecessors of a , is the set $\{x \in A \mid x \prec a\}$.

1. Show that $|\mathbb{R}| = 2^\omega = |\mathcal{P}(\omega)|$.
2. Let (A, \preceq) and (B, \leq) be two well ordered sets. Show that either $A \cong B$, there is a $b \in B$ so that $A \cong \text{pred}(b, B)$, or there is an $a \in A$ so that $\text{pred}(a, A) \cong B$.
3. Use Zorn's lemma to prove the Well Ordering Theorem.

Hints will be provided in a separate document so that you may try them without the hints first. You can always talk to me and I will help you work them.