

Assignment 7

MA1124

2016.

Due Wed 16th.

1. Use the l.u.b. axiom to prove the Bolzano-Weierstrass Thm.

Hint: Let $S = \{a \in \mathbb{R} : a \leq \text{infinitely many } b \in A\}$

2. Use the g.l.b. axiom to do the same

3. Prove $(A^{\circ})^c = \overline{(A^c)}$

4. Prove $(A^c)^{\circ} = (\bar{A})^c$

5. Prove A closed $\Rightarrow$ l.u.b(A) and g.l.b(A) $\in A$ if they exist.

6. Prove that the only subsets of $\mathbb{R}$ that are open and closed are $\mathbb{R}$ and $\emptyset$

Hint: use 5 and a result from last week.