

## 高微第二週作業

**Rudin :** p.22 # 6, 8; p.43 # 2, 4

### **Extra problems :**

1. Prove that there exists a unique positive real number  $x$  such that  $x^3 = 2$ .
2. Prove Proposition 1.14, 1.15, 1.16, and 1.18.
3. Consider  $A = \{p \in \mathbb{Q} \mid 0 < p < 1\}$  as a subset in the ordered set  $\mathbb{R}$ . Find  $\sup A$ , if exists.
4. Find  $\bigcup_{n=1}^{\infty} \left[0, \frac{1}{n}\right)$  and  $\bigcap_{n=1}^{\infty} \left[0, \frac{1}{n}\right)$ .
5. Let  $A$  and  $B$  be finite sets, prove that  $A \cup B$  is finite.
6. Let  $A$  and  $B$  be finite sets, prove that  $A \times B$  is also a finite set.