Math 1010-HW4

Problem 1.

(a) Prove that if α is a cut then

$$-\alpha := \{c - b : c \in \mathbb{Q}, c < 0, b \in \mathbb{Q} \setminus \alpha\}$$

is a cut.

(b) Prove that for all cuts α , $\alpha \geq 0^*$ if and only if $-\alpha \leq 0^*$.

Problem 2. Let α be a cut, $\alpha > 0^*$. Prove that

$$\alpha^{-1} := \{r \in \mathbb{Q} : r < 0\} \cup \{r \in \mathbb{Q} : 0 \le r < t \text{ for some } t \in \mathbb{Q} \text{ such that } \frac{1}{t} \notin \alpha\}$$

is a cut and $\alpha^{-1} > 0^*$.

Problem 3. Problem 8.2 (a), (e) and Problem 8.7 (a) (page 44).

Problem 4. Problem 8.4.

Problem 5. Problem 8.6.

Problem 6. Problem 8.10.

Problem 7. Problem 9.1.

Problem 8. Problem 9.6.