Midterm 1, Math 3210
Question 2 redo
To be turned in on February 11, 2013
You must write in complete sentences and justify all of your work.

Recall that a subset L of the rationals is a Dedekind cut if:

1. $L \neq \emptyset$ and $L \neq \mathbb{Q}$;

2. L has no largest element;

3. If $x \in L$ and $y \in \mathbb{Q}$ with $y < x$ then $y \in L$.

If L is a Dedekind cut show that the set

$$K = \{x \in \mathbb{Q} | \exists y \notin L \text{ with } x + y < 0\}$$

is a Dedekind cut.