Assignment 3 MA1124 2014.

1. We have seen how given an equivalence relation $\sim$ on X ~~the~~ equivalence classes form a partition of X and how given a partition of X we can define an equivalence relation. Prove that these maps are inverses of each other.

2. Starting with the fact that $ax = b$ does not always have a solution for $a, b \in \mathbb{Z}$, use a similar method to that used in going from $\mathbb{N}$ to $\mathbb{Z}$ to go from $\mathbb{Z}$ to $\mathbb{Q}$. Note that $\mathbb{Q}$ must have <u>two</u> well defined operations.

3. If $A \sim \{1, 2, \ldots, n\}$ and $B \sim \{1, 2, \ldots, m\}$ write out a <u>convincing</u> argument that $A \sim B \iff n = m$.

Due Monday 3rd Feb.