Extra Problems due 10/6

1. Find $c \in \mathbb{Z}, 0 \leq d < b$ so that $a = cb + d$ for
(i) $a = 137$, $b = 25$.
(ii) $a = 2564$, $b = 701$.

2. A subset, T, of $\mathbb{Z}$ is said to be bounded above if there exists $s \in \mathbb{Z}$ such that if $t \in T$ then $t \leq s$. Show that if $T \subset \mathbb{Z}$ is bounded above then T has a maximum element. (Hint: Consider $S = \{-t | t \in T\}$.)

3. Let $S = \{n \in \mathbb{N} | n = 5x + 7y \text{ with } x, y \in \mathbb{N}\}$. Let $T = \mathbb{N} - S = \{n \in \mathbb{N} | n \notin S\}$. Show that T is bounded above. Find the maximum element of T.