Name: _____

Pid: _____

1. (10 points) Let $n, k > 1$ be some integers and $\binom{[n]}{k} = \{A \subseteq [n] \mid |A| = k\}$. Show that there is a bijection from $\binom{[n]}{k}$ to $\binom{[n-1]}{k-1} \cup \binom{[n-1]}{k}$.

**Solution:**

2. (10 points) How many numbers $x$ from 1 to 999 such that at least one of the digits of $x$ is 7.

**Solution:**

3. (10 points) Let $S \subseteq [20]$ be a set. Show that if $|S| \geq 13$, then there are $a, b \in S$ such that $a - b = 6$.

**Solution:**