MATH 144, HANDOUT 2:
SOME INDUCTION PROBLEMS

Exercise 1. Let A, B, and C be subsets of some universal set U. Prove or disprove the following statement:

$$(A \cup B) \setminus (A \cap B) = (A \setminus B) \cup (B \setminus A).$$

Exercise 2. Define a sequence f_n by $f_0 = 1$ and $f_1 = 1$, and set $f_n = f_{n-1} + f_{n-2}$ for $n \geq 2$. Prove that f_{3n} is even for every $n \in \mathbb{N}$.

Exercise 3. Prove that for all integers $n \geq 0$, we have $3^{2n} - 1$ is divisible by 8.