1. Write down the contrapositive of the following implication:

If $a > b$ and $b > c$, then $a > c$.

2. Use (strong) induction to prove that every integer $n \geq 2$ is divisible by a prime.

3. Use (weak) induction to prove that $n$ cents of postage can be formed using 3 and 8 cent stamps for all $n \geq 15$.

4. The harmonic number $H_n$ is the sum of the first $n$ values of the harmonic series: $H_n = 1 + \frac{1}{2} + \frac{1}{3} + \ldots + \frac{1}{n}$. For example, $H_1 = 1$, $H_2 = 1 + \frac{1}{2}$, and $H_3 = 1 + \frac{1}{2} + \frac{1}{3}$. Use (weak) induction to prove that

$$\sum_{i=1}^{n} H_i = (n + 1)H_n - n.$$