1. Prove that for sets $A$, $B$ and $C$, $A - B \subseteq C$ if and only if $A \subseteq B \cup C$.

2. Prove that for functions $f$ and $g$, if $f$ and $g$ are surjective, then $g \circ f$ is surjective.

3. Prove that for integer $n$ and $k = 0, 1, 2$, $\left\lceil \frac{n-k}{3} \right\rceil = \left\lfloor \frac{n+2-k}{3} \right\rfloor$.

4. Evaluate $\sum_{k=1}^{n} 2^{\frac{n-k+1}{2}}$.

5. Evaluate $\sum_{k=1}^{n} \frac{1}{(n+k)(n+k+1)}$. 