

Name: _____

Pid: _____

1. (10 points) Show that $|\bigcup_{n \in \mathbb{N}} F([n], \{0, 1\})| = \aleph_0$.

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| Solution: |
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2. (10 points) Let $f_0 = 1$, $f_1 = 1$, and $f_n = f_{n-1} + f_{n-2}$ for all $n \geq 2$. Show that $f_{n+m} = f_{n-1}f_m + f_n f_{m+1}$.

Solution:

3. (10 points) Let $f_0 = 1$, $f_1 = 1$, and $f_n = f_{n-1} + f_{n-2}$ for all $n \geq 2$. Prove that $\gcd(f_n, f_{n+1}) = 1$.

Solution: