1. **[10 points]** Prove the following statement using FPMI: For all integers $n \geq 1$,

$$1 + 4 + 7 + 10 + \cdots + (3n - 2) = \frac{n(3n - 1)}{2}.$$

2. **[10 points]** Let $a_1 = 1$ and $a_2 = 3$, and define

$$a_n = 3a_{n-1} - 2a_{n-2}$$

for $n > 2$. Prove using SPMI that $a_n = 2^n - 1$ for all positive integers n.