February 6, 2008

Problem 3.39

Let S_n be the hexagonal arrangements consisting of n rings of dots. Let a_n be the number of dots in S_n. Find formulas for a_n and $\sum_{k=1}^{n} a_k$.

Problem 3.41

Let $f : \mathbb{R} \to \mathbb{R}$ be a function such that

$$f(x + y) = f(x) + f(y) \quad \forall x,\ y\ \in \mathbb{R}.$$

1. Prove that $f(0) = 0$.

2. Prove that $f(n) = nf(1)$ for all $n \in \mathbb{N}$.