5. Determine the generating function $F(x) = \sum_{n\geq 0} c_n x^n$ for
   (a) $c_n = n^2$.
   (b) $c_n = \frac{1}{n+1}$.
6. Show that $\left(\mathbb{K}^{\mathbb{N}}, +, \cdot\right)$ is a commutative ring with one.
7. Show that $(\mathbb{K}[\![x]\!], +, \cdot)$ is an integral domain.
8. Show that the map $D_x : \mathbb{K}[\![x]\!] \to \mathbb{K}[\![x]\!]$ defined as
$$D_x \sum_{n=0}^{\infty} a_n x^n := \sum_{n=0}^{\infty} (n+1) a_{n+1} x^n,$$
   turns $\mathbb{K}[\![x]\!]$ into a differential ring.