Class test 4: Weierstrass preparation theorem

Exercise 4.1. Find the Weierstrass polynomial for the function $\sin(x^2 + y^3)$ on $\mathbb{C}^2$.

Exercise 4.2. Find the Weierstrass polynomial for the function $(x + y)(y + 1)x$ on $\mathbb{C}^2$.

Exercise 4.3. Find the Weierstrass polynomial for the function $(e^x - e^y)^3$ on $\mathbb{C}^2$.

Exercise 4.4. Let $f : \Delta \longrightarrow \Delta$ be a holomorphic map on a disk $\Delta \subset \mathbb{C}$, obtained as a limit $f = \lim_i f_i$, where $f_i : \Delta \longrightarrow \Delta$ are also holomorphic. Suppose that all f_i are injective; prove that f is injective.