Complex Manifolds - problem list no. 2 - zadania na 31.10

1 Suppose $n > 1$, $f : \mathbb{C}^n \to \mathbb{C}$ holomorphic. Show that if the zero set $Z(f)$ is compact, then it is empty.

2 Suppose $U \subset \mathbb{C}^n$ is open and non-empty. Is the ring of holomorphic functions on U a unique factorisation domain?

3 Find the Weierstrass polynomial for $f(z_1, z_2) = z_1^3 z_2 + z_1 z_2 + z_1^2 z_2^2 + z_2^2 + z_1 z_2^3$ at 0.

4 Suppose $U \subset \mathbb{C}^n$ is connected and $0 \neq f : U \to \mathbb{C}$ is holomorphic. Show that $U \setminus Z(f)$ open dense and connected.

5 [Referat dla MJ] Let $f : U \to V$ be a holomorphic function, which is bijective. Show, that f^{-1} is holomorphic. [Huybrechts: Proposition 1.1.13]