1. Construct a polynomial, $P(z)$, with a repelling fixed point at $z = 0$ and $|P'(0)| > \deg P$. Using material presented in class show that the function $h$ satisfying $P(h(z)) = h(\lambda z)$ has infinitely many zeros.

2. Suppose that $f$ is a polynomial such that $f(0) = 0$, $f'(0) = \lambda$ and $\lambda^n = 1$. Show by a direct method that if $f$ can be conformally conjugated to $z \mapsto \lambda z$ near $0$ then $f(z) = \lambda z$.

   What about the case of a general $f$ defined near $0$?

3. For $f(z) = z^2 + 2z$, find $\varphi$, conformal near $0$, $\varphi(0) = 0$, such that $\varphi(f(z)) = 2\varphi(z)$. What is $h = \varphi^{-1}$?