3. Prove that there is no function g holomorphic in a neighborhood of the origin so that $g\left(\frac{1}{n}\right) = \frac{1}{n^n}$.

4. Let a be a complex number and ϵ a positive number. Prove that the function

$$h(z) = \sin z + \frac{1}{z-a}$$

has infinitely many zeros in the strip $|\text{Im } z| < \epsilon$.

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