Title

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1.1 Singularities

Recall that there are three types of singularities:

- Removable
- Poles
- Essential

Theorem 1.1 *(3.2).*
An isolated singularity z_0 of f is a pole $\iff \lim_{z \to z_0} f(z) = \infty$.

Theorem 1.2 *(3.3, Casorati-Weierstrass).*
If f is holomorphic and has an essential singularity z_0, then $f(D_r(\{z_0\}) \setminus \{z_0\})$ is dense in $\mathbb{C}$.

Proof .
Proceed by contradiction.

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