

Theorem 1 (Residue Theorem). Let f be analytic in the region G except for the isolated singularities a_1, a_2, \dots, a_m . If γ is a closed rectifiable curve in G which does not pass through any of the points a_k and if $\gamma \approx 0$ in G then

$$\frac{1}{2\pi i} \int_{\gamma} f = \sum_{k=1}^m n(\gamma; a_k) \text{Res}(f; a_k).$$

Theorem 2 (Maximum Modulus). Let G be a bounded open set in \mathbb{C} and suppose that f is a continuous function on G^- which is analytic in G . Then

$$\max\{|f(z)| : z \in G^-\} = \max\{|f(z)| : z \in \partial G\}.$$

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