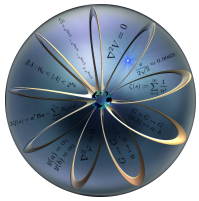

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closed curve theorem

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Let $U \subset \mathbb{C}$ be a simply connected domain, and suppose $f : U \longrightarrow \mathbb{C}$ is holomorphic. Then

$$\int_C f(z)\ dz = 0$$

for any smooth closed curve C in U.

More generally, if U is any domain, and C_1 and C_2 are two homotopic smooth closed curves in U, then

$$\int_{C_1} f(z)\ dz = \int_{C_2} f(z)\ dz.$$

for any holomorphic function $f : U \longrightarrow \mathbb{C}$.