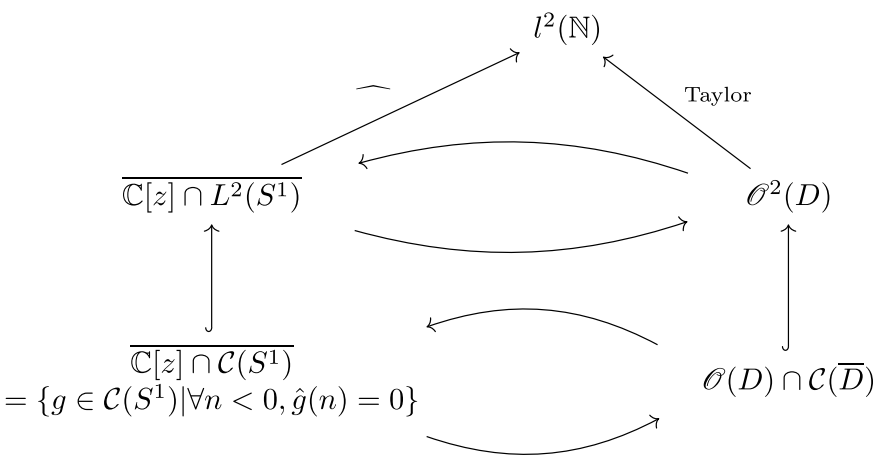


This note, that [was found here](#), as a part of [a collection](#) is written (completely with human hands) by [Rupadarshi Ray](#), was created on September 2, 2026 12:31:07 AM, was last modified on September 3, 2026 2:32:46 PM, and was exported on September 7, 2026 3:09:58 PM.

Reconstructing $\mathcal{O}(D)$ from its boundary values



continuous on the boundary S^1



$$\text{res} : \mathcal{O}(D) \cap \mathcal{C}(\overline{D}) \rightarrow \mathcal{C}(S^1)$$
$$\sum_{n \in \mathbb{N}} a_n z^n \mapsto \sum_{n \in \mathbb{N}} a_n e^{in\theta}$$

is an isometric isomorphism onto the closed subalgebra

$$\{g \in \mathcal{C}(D) | \forall n < 0, \hat{g}(n) = 0\} \subseteq (\mathcal{C}(S^1), \|\cdot\|_\infty)$$



- $\overline{\mathbb{C}[z] \cap (\mathcal{C}(\overline{D}), \|\cdot\|_\infty)} = \mathcal{O}(D) \cap \mathcal{C}(\overline{D})$
- By maximum modulus, for $f \in \mathcal{O}(D) \cap \mathcal{C}(\overline{D})$ there is a $z_0 \in S^1$ such that

$$\|f\|_\infty = f(z_0) = \|f|_{S^1}\|_\infty$$

so res is an isometric embedding.

[1]

[2]

L^2 on the boundary S^1

Current note has 0 direct children and 0 total descendants.

- [stem](#)
 - [subobjects of and functions on \$\mathbb{R}^n, S^n, \mathbb{C}^n\$ and its quotients \$\Gamma \backslash \mathbb{R}^n, \Gamma \backslash \mathbb{C}^n\$](#)
 - [Holomorphic functions on spaces over \$\mathbb{C}\$ of dimension 1](#)
 - [\$\mathcal{O}\(D\)\$](#)
 - [Reconstructing \$\mathcal{O}\(D\)\$ from its boundary values](#)

And it has 5 siblings.

- [stem](#)
 - [subobjects of and functions on \$\mathbb{R}^n, S^n, \mathbb{C}^n\$ and its quotients \$\Gamma \backslash \mathbb{R}^n, \Gamma \backslash \mathbb{C}^n\$](#)
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 - [\$\mathcal{O}\(\overline{D}\)\$](#)
 - [\$\mathcal{O}\(D\) \cap \mathcal{C}\(\overline{D}\)\$](#)
 - [\$\mathcal{O} \cap L^2\(D\)\$](#)
 - [Reconstructing \$\mathcal{O}\(D\)\$ from its boundary values](#)

1. [Anton Deitmar, Siegfried Echterhoff - Principles of Harmonic Analysis \(Universitext\), p.43](#) ↩
2. [conwaycx2, 4 The Disk Algebra](#) ↩