

Needham, Chapter 8, Exercise 10, p. 421

G. Palmer, July 8, 2017, 5 pm PST

10 Use (23) to verify (9).

From p. 395, $\oint_L \bar{z} dz = 2i \sum_{\text{inside}} v_j \mathcal{A}_j$.

$$K = \sum_j v_j C_j \quad \text{by (23), p. 416.}$$

Needham shows that (23) is true for any K (p. 416). Let L be an instance of K . Then

$$\begin{aligned} \oint_L \bar{z} dz &= \oint_K \bar{z} dz = \oint_{\sum_j v_j C_j} \bar{z} dz = \sum_j v_j \oint_{C_j} \bar{z} dz \\ &= \sum_j v_j (2i \mathcal{A}_j) = 2i \sum_j v_j \mathcal{A}_j \end{aligned}$$

This is what we wanted to show.