Homework 12 of Introduction to Analysis(II)

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1. (a) Since E is Jordan region, $\mathrm{Vol}(\partial E) = 0$.

   (b) Since $\mathrm{cl}(E) \subseteq \mathrm{int}(E) \cup \partial E$ and $\mathrm{int}(E) \subseteq E \subseteq \mathrm{cl}(E)$,

   $$\mathrm{Vol}(\mathrm{cl}(E)) \leq \mathrm{Vol}(\mathrm{int}(E)) + \mathrm{Vol}(\partial E) = \mathrm{Vol}(\mathrm{int}(E)) \leq \mathrm{Vol}(E) \leq \mathrm{Vol}(\mathrm{cl}(E)).$$

   Therefore, $\mathrm{Vol}(\mathrm{cl}(E)) = \mathrm{Vol}(\mathrm{int}(E)) = E$.

   (c)