

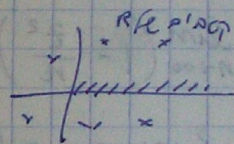
9/11/20

$$R(z) = O\left(\frac{1}{|z|^2}\right)$$

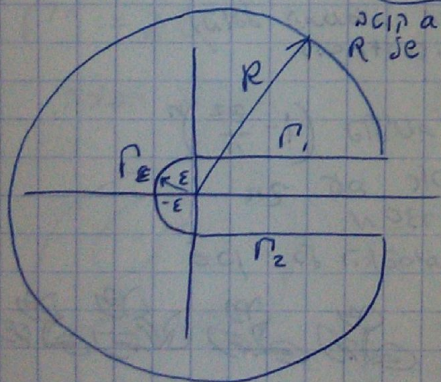
$$f(z) = R(z) \log z$$

(4) $\arg z \in (0, 2\pi]$

$$\int_0^{\infty} R(x) dx = - \sum_{\substack{\text{poles} \\ \text{in } \mathbb{R}^+}} \text{Res}_a f$$

$$\begin{pmatrix} 5 & 10 \\ -1 & \log 2 \end{pmatrix}$$


$$E < 1 \quad R > 2$$



נח' ע. אפוא נספ'ק :- ר' יצחק מוס'ק נב
לע. ונתפ'ק - בחיוב.

$$\frac{1}{2\pi i} \int_{\Gamma} f(z) = \sum_{\substack{2\pi i \alpha \\ R \in \mathbb{C}}} \text{res}_a f$$

$$\Gamma_1: x + i\varepsilon$$

$$\left| \int_{\Gamma_R} f(z) \right| \leq 2\pi R \max_{z \in \Gamma_R} f(z) = 2\pi R \underset{|R| \rightarrow \infty}{O}\left(\frac{\log R}{R^2}\right) \xrightarrow{R \rightarrow \infty} 0$$

$$\left| \int_E f(z) \right| \leq \pi \varepsilon \cdot \max_{z \in E} f(z) \leq \bigcup_{\substack{R \text{ is} \\ \text{union}}} \varepsilon |\log \varepsilon| \xrightarrow{\varepsilon \rightarrow 0} 0$$

$$\lim_{\substack{E \rightarrow 0 \\ R \rightarrow 0}} \int_{\Gamma_2} f(z) dz = - \int_0^{\infty} R(x) (\log x + 2\pi i)$$

$$\lim_{\substack{\varepsilon \rightarrow 0 \\ R \rightarrow \infty}} \int_{\Gamma_\varepsilon} f(z) dz = \int_0^\infty K(x) \log x dx$$

$$-2\pi i \int_0^{\infty} R(x) dx = 2\pi i \sum_{R \text{ in } \mathcal{A}_1} \text{Res}_a f$$

