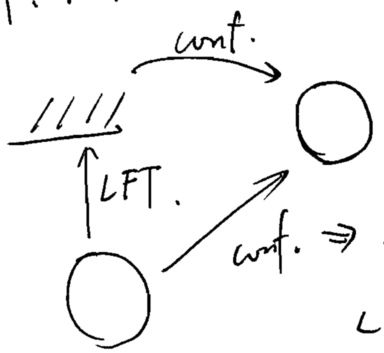
10/6 Wei Wu.

HW: $f: \mathbb{H} \xrightarrow{\text{conf.}} \mathbb{D}$. $\Rightarrow$ f is LFT



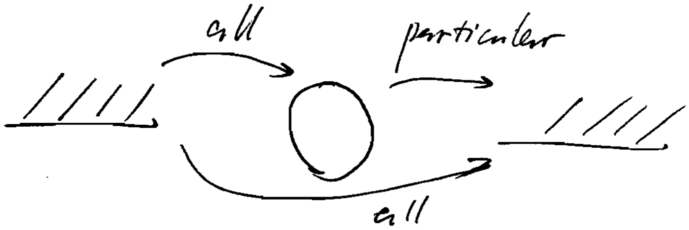
(note $\frac{z-i}{z+i} : \mathbb{H} \to \mathbb{D}$. take $w = \frac{z-i}{z+i}$

$\Rightarrow z = -i\frac{w+1}{w-1}$: $\mathbb{D} \to \mathbb{H}$)

conf. $\Rightarrow$ LFT let $f(a) = 0$. $\Rightarrow$ $f(z) = e^{i\theta}\frac{z-a}{z-\bar{a}}$

LFT can only applies when bdry of all domains are "circle".

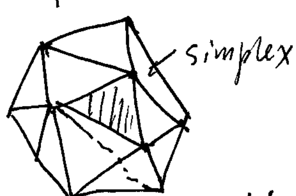
$f: \mathbb{H} \to \mathbb{H}$



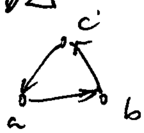
General Form of Cauchy Theorem.

Homology.

Simplicial Homology



$\partial\Delta$ $\partial[a,b] = \{b\} - \{a\}$



$\partial(\Delta abc) = (ab) + (bc) - (ac)$

H_n formal "linear comb." of simplexes Δ_K of dim n.

chain

$\sum a_n \Delta_n$. $a_n \in \mathbb{Z}$.

$\partial \sum a_K \Delta_K = \sum a_K \partial \Delta_K$.

cycle ~~chain~~: $\partial \sum a_K \Delta_K = 0$.

Prop. $\partial\partial = 0$.

$H_n \triangleq \{\text{cycles of order } n\} / \partial\{\text{chains of order } n+1\}$

Prop. If 1-cycle $\gamma \sim 0 \Rightarrow \int_\gamma f(z)dz = 0$ if f is analytic over simplex

Singular Homology.

simplex

Consider $\sigma_k : \Delta_k \longrightarrow X$

chains, boundary, sing. homology class...