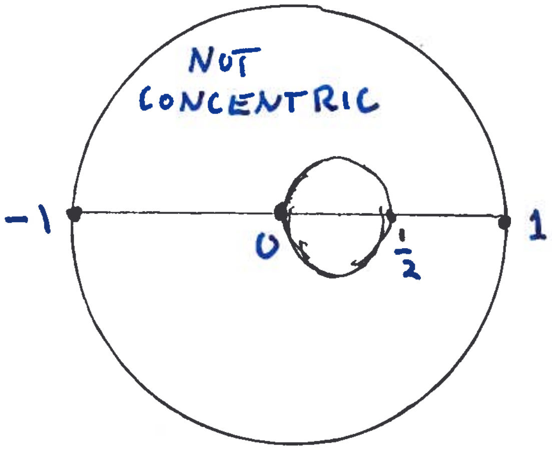
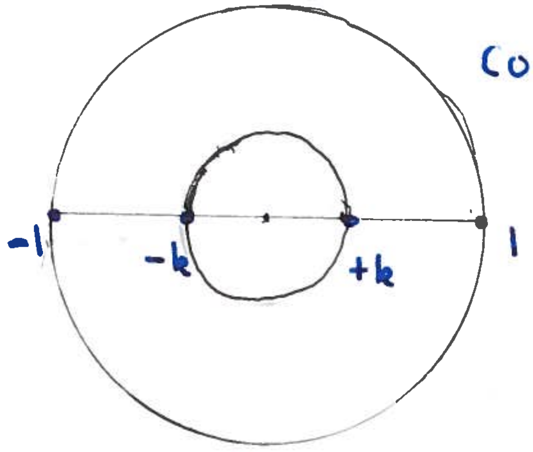
$|z|<1, \quad |z-\tfrac{1}{4}| > \tfrac{1}{2}$

$k < |w| < 1$



$|z| = 1$



CONCENTRIC

$k = ?$

$|w| = 1$

$$\begin{cases} -1 \longleftrightarrow -1 \\ 1 \longleftrightarrow 1 \\ 0 \longleftrightarrow -k \\ \frac{1}{2} \longleftrightarrow +k \end{cases}$$

$$\frac{w+1}{w-1} = K\,\frac{z+1}{z-1}$$ Möbius tr.

- $z=0$, $w=-k$ yields

$$K = \frac{1-k}{1+k}$$

- $z=\frac{1}{2}$, $w=+k$ yields

$$k = 2-\sqrt{3}, \quad K = \frac{1}{\sqrt{3}}$$

This is the sought radius

$$w = \frac{(1+\sqrt{3})z + 1 - \sqrt{3}}{(1-\sqrt{3})z + 1 + \sqrt{3}} = \frac{(2+\sqrt{3})z - 1}{-z + 2 + \sqrt{3}}$$

Remark It is impossible to map the center $z_0 = \frac{1}{4}$ to the center $w_0 = 0$!