

# Riemann mapping theorem.

1. Remind formulation.

2. Tools: hyperbolic metric  
Normal families.

} Interesting/  
important  
by themselves!

3. Hyperbolic metric:

• Schwarz lemma:

- Original
- with derivative.

• Reminder: conformal mappings of the disk onto itself

• Pick lemma.

• Hyperbolic metric:

- introduction, definition  
(conformal mappings preserves length)
- hyperbolic distance between  $\#$  points.
- geodesic analytic
- every mapping  $f: \mathbb{D} \rightarrow \mathbb{D}$  is compressing
- calculation some distance.

## 4. Normal families

- Uniform convergence on compact sets.
- Definition of normal family.
- Family of bounded functions is normal
- Digression #1: Arzela-Ascoli theorem.
- Digression #2: Unbounded families.
- ~~Application to...~~

### 4a. Univalent functions

Schwarz theorem

Application to univalent functions

## 5. Proof of the Riemann mapping theorem.