

List of Topics

5. Fifth presentation(October 29) :

- Gauss-Bonnet theorem for hyperbolic triangle([A], [S], [W])
- Gauss-Bonnet theorem for hyperbolic polygon([A], [S],[W])
- Necessity condition for tessellation(tiling) of the hyperbolic plane by regular polygons([W, Theorem 7.3.1])
- Examples of hyperbolic tessellation.([W])
- Hyperbolic trigonometry([A], [S], [W])

6. Sixth presentation(November 5)

- Preliminaries on group actions (discreteness, orbits, stabilizer) ([W], For stabilizer, please check [K, Section 2] or Wikipedia.)
- Fuchsian group([W], [S], [K])
- Examples of Fuchsian groups ([W, Section 12.3], [S])
- Convexity([S])
- Fundamental domain([W].[S], [K])
- Examples of Fundamental domains([W, Section 13.2], [S, Section 5.3])
- Two fundamental domains with a finite area have the same area ([W])
- Dirichlet polygon(domain) ([W], [S])
- Perpendicular bisector ([W], [S])
- Construction of Dirichlet polygon(domain) ([W], [S])
- Examples of Dirichlet polygons(domains) ([W], [S])

7. Seventh presentation(November 12)

- Side-pairing transformations([K], [S], [W])
- Examples of side-pairing transformations ([K],[S], [W])
- Group and presentation ([W])
- Elliptic cycles([K], [S], [W])
- Angle sum([K, Theorem 3.5.3], [S], [W])
- [A Dirichlet domain is locally finite\(Optional\)\(\[K, Theorem 3.5.1\]\)](#)
- Side-pairing transformations generate Fuchsian group(without proof) ([W], [K, Theorem 3.5.4])
- Poincaré theorem : the case of no boundary vertices(without proof) ([W])
- Examples(In particular, example of hyperbolic octagon) ([W])
- [Parabolic cycles\(\[W\]\)](#)
- Poincaré theorem : the case of boundary vertices(without proof) ([W])

- Examples ([K], [S], [W])

8. Eighth presentation(November 19)

- Quotient space ([W], [S], [K])
- Marked point and cusp([W])
- Examples of marked points
- Examples of cusps
- Genus g surface ([W], Wikipedia)
- Euler characteristic([W], [K], [S])
- Signature of cocompact Fuchsian group([W], [K], [S])
- Examples
- Area of Dirichlet polygon of a cocompact Fuchsian group([W], [K])
- Lower bound for the area of a Dirichlet domain of a cocompact Fuchsian group([W, Propostion 21.4.2]).
- [W, Exercise 21.2]
- [W, Exercise 21.3 (i)]
- Existence of a Fuchsian group with a given signature([W, 22.2.1])