Exercise 1. (branched covering 1)
Consider the polynomial \( f(z) = z^3 - 3z \) as a holomorphic function \( \hat{\mathbb{C}} \rightarrow \mathbb{C} \). What are the ramifications points of \( f \) and what are their ramification indices? What are the branch points? Draw an image of the covering.

Exercise 2. (branched covering 2)
Let \( M \) be a (compactified) elliptic or hyperelliptic curve \( w^2 = p(z) \), where \( p \) is a polynomial of degree \( n \geq 3 \). Consider \( w \) as a holomorphic function \( M \rightarrow \hat{\mathbb{C}} \). What are its ramification points and what are their ramification indices? (Consider the cases of even and odd degree separately.)

Exercise 3. (glueing surfaces from polygons)
(a) What surface do you get by glueing opposite sides of a hexagon according to the scheme \( abca^{-1}b^{-1}c^{-1} \)? Draw a picture of the surface embedded in \( \mathbb{R}^3 \) showing its seams with labels.
(b) What surface do you get by glueing opposite sides of a octagon according to the scheme \( abcda^{-1}b^{-1}c^{-1}d^{-1} \)? Draw a picture of the surface embedded in \( \mathbb{R}^3 \) showing its seams with labels.