1. What is the radius of the largest unramified disk for the map \( f : \Delta \to \mathbb{C} \) given by \( f(z) = e^{z^2} \)? (Recall a disk \( B(p, r) \subset \mathbb{C} \) is *unramified* if there is a holomorphic map \( h : (p, r) \to \Delta \) such that \( f(h(z)) = z \) for all \( z \in B(p, r) \).)

2. Prove that the Little Picard Theorem implies directly that there is a constant \( M > 0 \) such that any holomorphic map \( f : \Delta \to \mathbb{C} - \{0, 1\} \) satisfies \( \|f'\| \leq M \), where the derivative is measured using the hyperbolic metric on the domain and the spherical metric on the range. (Hint: supposing the derivative tends to infinity, construct a nonconstant entire function \( f : \mathbb{C} \to \mathbb{C} - \{0, 1\} \).)

3. Let \( T \subset \mathbb{R}^2 \) be a (closed) Euclidean triangle, and let \( G \subset \text{Isom} (\mathbb{R}^2) \) be the group generated by reflections in the sides of \( T \). (i) Show that the tiles \( T_g = \{g(T) : g \in G\} \) cover \( \mathbb{R}^2 \). (ii) Give an example where every point in \( \mathbb{R}^2 \) belongs to the interior of at most one tile. (iii) Give an example where every point in \( \mathbb{R}^2 \) belongs to the interior of infinitely many tiles. (Hint: the closure of \( G \) is a Lie subgroup of \( \text{Isom} (\mathbb{R}^2) \).)