1. Prove that there is a unique holomorphic function $f: \mathbb{C} \to \mathbb{C}$ such that $f'(z) = f(z)$ and $f(0) = 1$. **Hint:** Let $g$ be another such function and consider the function $h(z) = f(z)g(-z)$. What do you know about $h(z)$?

2. Let log denote the principal branch of the logarithm, which is defined on the complement of the negative real axis and whose values have imaginary part in $(-\pi, \pi)$.

    (a) Show that $\log(zw) - \log(z) - \log(w) \in 2\pi i \mathbb{Z}$.

    (b) Consider the triangle whose vertices are distinct complex numbers $a, b, c$. Give formulas in terms of log for the angles between the edges of the triangle.

    (c) Use (a) and (b) to show that the sum of the angles in a triangle is $\pi$.


4. Gamelin, page 57, exercises 4, 5, 6, 7.