

EXERCISE 9 IN BASIC ALGEBRAIC TOPOLOGY

Problem 1. Prove that S_2^2 can be covered by any surface S_g^2 , $g \geq 3$. Prove that S_m^2 can be covered by S_n^2 if $2 \leq m < n$ and $n - 1$ is divisible by $m - 1$.

Problem 2. Let $p_1 : \tilde{X}_1 \rightarrow X_1$, $p_2 : \tilde{X}_2 \rightarrow X_2$ be covering maps. Prove that $p_1 \times p_2 : \tilde{X}_1 \times \tilde{X}_2 \rightarrow X_1 \times X_2$ is a covering map.

Good luck!