Simply Connected Spaces; The Principle of Monodromy:

$\tilde{B}_1, p_1$ & $\tilde{B}_2, p_2$ covering spaces of B are <u>isomorphic</u> if $\exists$ a homeo $\varphi : \tilde{B}_1 \to \tilde{B}_2$ s/t $p_2 \circ \varphi = p_1$.

<u>Def:</u> B connected & locally connected. B is <u>simply connected</u> if every covering space is isomorphic to the trivial covering space (B, id).

<u>Lemma 1:</u> (Sometimes useful to prove that a space is simply connected) $p : \tilde{B} \to B$ covering. If $\exists\, U \overset{open}{\subseteq} \tilde{B}$ s/t $p|_U$ is 1-1 onto B, then p is a homeomorphism.

<u>Proof:</u> Exercise.

<u>Propn 1:</u> If B_1 & B_2 are simply connected, so is $B_1 \times B_2$.