On each of the five questions below, the correct answer is either TRUE or FALSE. However, you may instead answer TRUISH or FALSISH. If the correct answer is TRUE, then TRUE earns 3 points, TRUISH earns 2 points, FALSISH earns 1 point, and FALSE earns 0 points. If the correct answer is FALSE, then these point values are of course reversed. Do not write just T or F; write your answer completely and clearly. No explanation is needed! You have 10 minutes to complete this portion of the exam.

A. If $Y \subseteq X$, both X and Y are path-connected, $r : X \to Y$ is a surjective map, and $i : Y \hookrightarrow X$ is the inclusion, then r_* is surjective and i_* is injective.

B. If E is simply connected and $p : E \to B$ is a covering map, then for all $b \in B$ there exists a bijection between $\pi_1(B, b)$ and $p^{-1}(b)$.

C. If X is a compact n-manifold, then X is Hausdorff, has a countable basis, and is covered by a finite collection of open sets, each of which is homeomorphic to an open subset of $\mathbb{R}^n$.

D. If X is Hausdorff, has a countable basis, and is covered by a finite collection of open sets, each of which is homeomorphic to an open subset of $\mathbb{R}^n$, then X is a compact n-manifold.

E. If $X = \{(x, \sin(1/x)) : x > 0\} \subseteq \mathbb{R}^2$ is the graph of $y = \sin(1/x)$ for $x > 0$, then $\pi_1(X, x_0)$ is trivial for all $x_0 \in X$.