

ALGEBRAIC TOPOLOGY I

(MTH566)

Quiz 1

Wednesday, 14th January 2026

Name: _____

Roll Number: _____

Obtained Marks: _____ /10

EXAMINATION INSTRUCTIONS

1. This is a **Closed Book Examination**.
 2. Answer all questions in the space provided on subsequent pages.
 3. Show all necessary working steps clearly and legibly.
 4. State any theorems or results used. Only results discussed in lectures may be used without proof.
 5. **Duration:** 25 minutes.
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Good Luck!

Problem Set

→ **Problem 1**

Consider the following picture: Are the spaces X and Y homeomorphic? Space Y has the

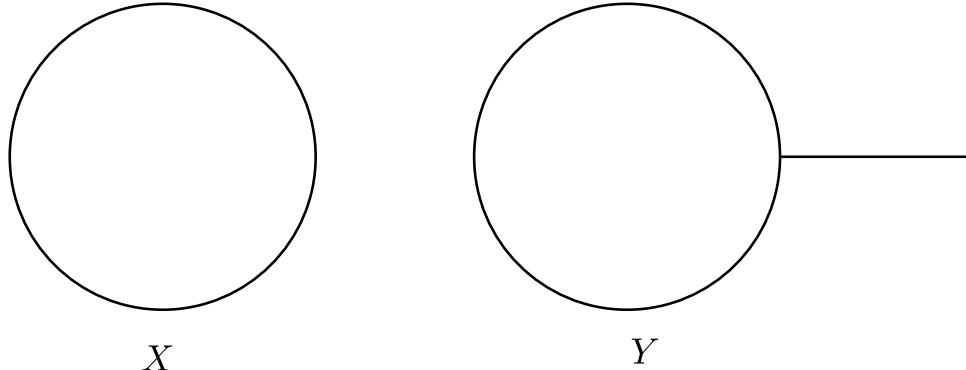


Figure 1: Are they homeomorphic?

arc with finite length.

→ **Problem 2**

If $f : \mathbb{R} \rightarrow \mathbb{R}$ is a continuous function, show that the set of points which are left fixed by f is a closed subset of \mathbb{R} .

→ **Problem 3**

Let X denote the set of all real numbers with cofinite topology. Define

$$f : (\mathbb{R}, \mathcal{T}_{Euc}) \rightarrow X, \quad f(x) = x.$$

- (i) Is f continuous?
- (ii) Is f a homeomorphism?



SOLUTION SPACE

Write your solution from the next page.

Begin Your Solution

Solution (continued)