6월 22일(목)
재시

19 年度 第 學期 試驗答案紙

科目名	위상	教授名	김 명 훈

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$A \cup B = \emptyset$
$\bar{A} \cup B = \emptyset$

成績 95/100

1. No : f is bijective and continuous.
But f^{-1} is not continuous.
$U = [0, \frac{1}{2})$ of the domain is not open in S^1

2. No ~~f is not surjective~~

3. pf) $S^1 = \{(x,y) \in \mathbb{R}^2 \mid x^2+y^2=1\}$
Let $f : [a,b] \to S^1$ defined by
$f(t) = (\cos 2\pi t, \sin 2\pi t)$
Then ∃ no continuous surjective map g
(here g is the map of the inverse of f)

4. Let $f : [0, \frac{1}{2}] \cup [1, \frac{3}{2}] \to S^1$ defined by
$f(t) = (\cos \pi t, \sin \pi t)$
then f is continuous and surjective

5. Let $Y = \mathbb{Z}_+ \cup \{\infty\}$ by Thm 8.1
Since $\mathbb{Z}_+$ is not compact, each open set
$Y - C$ containing the point ∞ intersects $\mathbb{Z}_+$
Therefore ∞ is a limit point
(here C is a compact subset of $\mathbb{Z}_+$)

6. Prove that [0,1] is not connected in the lower limit topology.
pf) Let $[a,b) = \{x \mid a \le x < b\}$ where $a<b$
Then for some element b in [0,1]
for some b, ∃ the interval [b,1]
Therefore [0,b) and [b,1] is not connected

7. X two point space in the indiscrete topology
$\mathbb{Z}_+ = \{1,2,3,\dots\}$
Prove that $X \times \mathbb{Z}_+$ is limit point compact
pf) Choose a subset B of $\mathbb{Z}_+ \times X$
The set B has an upper bound b in $\mathbb{Z}_+ \times X$
Then B is a subset of the interval [1, b]
of $X \times \mathbb{Z}_+$, since $X \times \mathbb{Z}_+$ has the least upper bound property ~~the~~ interval [1, b] is compact
by Thm 7.1 B has a limit point x in [1, b]
Thus $X \times \mathbb{Z}_+$ is limit point compact.

19 年度 第 學期

試驗答案紙

科目名	Topology	敎授名	

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成績
0/100

1995 年度 第 1 學期

試驗答案紙

科目名	위상수학 I	敎授名	김 [illegible]

이과 大學 수 學科 4 學年 班	學番 第 [illegible] 番	姓名	김 [illegible]	檢印	

成績
0/100

X

6월 22일 (목)

재시

試驗答案紙

1995 年度 第 1 學期

科目名	위상수학 I	敎授名	김명호

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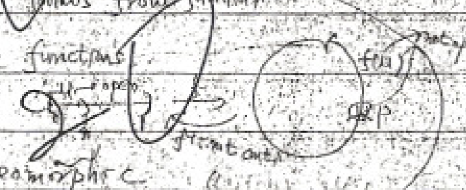
成績
65/100

1. Is $[0,1) \xrightarrow{f} S^1 = \{(x,y) \in \mathbb{R}^2 \mid x^2+y^2=1\}$, $t \longrightarrow (\cos 2\pi t, \sin 2\pi t)$ homeomorphic?

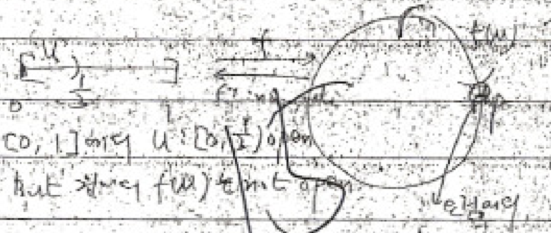
f is bijective and continuous follows from familiar properties of trigonometric functions.

But f^{-1} not continuous

∴ not homeomorphic.



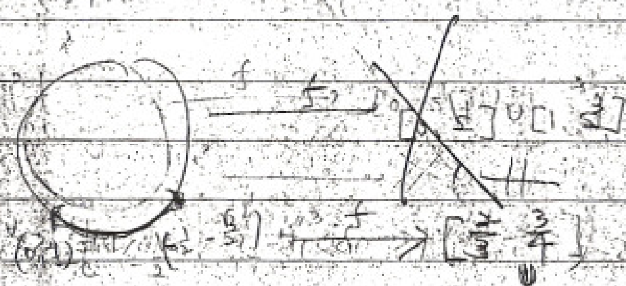
2. Is $[0,1]$ homeomorphic to S^1?



$[0,1]$에서 $U=[0,\frac{1}{2})$ open but 정에서 $f(U)$는 not open

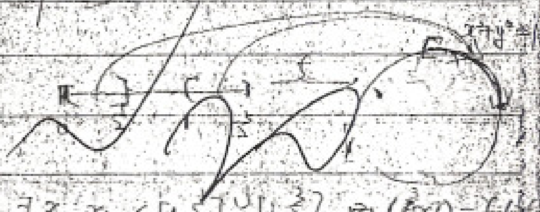
∴ not homeomorphic

3. Prove that ~~there exists no continuous sur-~~ jective map from S^1 to $[0,\frac{1}{2}] \cup [1,\frac{3}{2}]$



nit not surjective

4. Prove that there exists a continuous surjective map from $[0,\frac{1}{2}] \cup [1,\frac{3}{2}]$ to S^1?



$\exists\, x_1, x_2 \in [0,\frac{1}{2}] \cup [1,\frac{3}{2}] \Rightarrow f(x_1) = f(x_2)$

5. Let $\mathbb{Z}_+ = \{1,2,3,\cdots\}$

$Y = \mathbb{Z}_+ \cup \{\infty\}$ one-point compactification

Prove that ∞ is a limit point.