0. Introductions (everyone) + sincy 1. Intro to topology Notions of space in mathematrics <u>Planer spaces</u> (rets of parts in R <sup>2</sup> ) Which of the follows space are "the same"? (Discuss geometry vs topology) In topology, dictance cant mather, two spaces are "honecomorphic" if there is a continues conceptedate televen them: Equivalently: $f(x, -y)$ and $g(y \rightarrow x)$ are insists to extended Continues: Informally: the map $X \rightarrow Y$ doort low it or file it, and vice-retra Not continues correspondence • Formally: for every $y = f(x)$ in Y, and neighborhood around $y$ (= parts within a small distance $d(x)$ )	Spases and summetizes (1		· · · · · ·	· · · · ·	· · · · ·	· · · · ·
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υ · · · · · · · · · · · · · · · · · · ·	• • •	$f \circ g(x, x^2) = f(x, x^2) = f(x) = f(x) = (x, x^2)$
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Step 2: Find a contin	wous map J:X	$\rightarrow$ $\gamma$	· · · · · ·	
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مر (x,y) = (x,y	(+1)		· · · · · · · ·	$(-1,0) = (-1,0) = g_{c}(-1,0)$
g <sub>c</sub> (x,y) = (x, -1	i-x)		· · · · · · · · · · · · · · · · · · ·	$(0,-1) = (0,-1) = g_{0}(0,-1)$
$g_{0}(x,y) = (x, -$	1+x)	· · · · ·		$(1,0) = (1,0) = \int_{A} (1,0)$
Step 4 Check that	$g \cdot f = id_x$			
$a \circ g_A (x, \overline{1-x^*}) =$	$f_{A}(x, 1-x)$	$= (x, \sqrt{1-x^2})$	· ✓	
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Exercises	• •	• •	• •										•	•							
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c`	) (Chall	ince) the	intervo		(مر		nr a<	ь Ь	• •		•		•	•		•	•	•	• •	•	•
2 An	nue that	יין א. א לי			· · ·	ין ני  המנה			haven	 calar			in time		nottor	tur	•		 I and	, 7	•
<b>n</b> , (")(	у <b>с</b> . ( ) ,	· · · · ·	un upo	~			 										, syata	<i>.</i>		•.	•
ave	nomeomorf	Maïc, Th	en X	ava	·. t.	OW	e home	somorf	phic.	· ·	•	· ·		•	•••		•	•	· ·	•	•
3. K	rove the	at the	(empt	<b>)</b> . 1	triang	fle .	X unt	n vert	ti <b>æs</b> (	, <b>(</b> 0, 0), (	(1,0)	and	(0,1	) <sub>.</sub>	and	The	(empt	τų) †	riangle	У.	•
with	vertices	(0,0),	(1,0)	and	(2,	1)	ave	home	omorphic	• •	Challe	nge:	prove t	his f	or the	ir in	teriors	too.	• •	•	
	· . ·					• •	• •	•	• •	• •	•	• •	· · .	<u>۸</u>	· .	•					
4. Kr	ove that	the.	"tripod	•			. is. nd	ł. ho	swanioch	nic to	the	unit	inte	rval.	. (H	lint:	what A	happen	s when	we r	iewo.
4. Kr	ove that	the .	"tripod				is no	t ho	omeomorp	hic to	the	unit	inte Dulia	rval .	(H	lint: * +	what the on	happen igivn )	s when	ue r	10 M D
4 Rri 5 ((ha	ove that Maye) Rea	the US that	"tripod" : 1-ma	unifolds	are	star	is no nees tha	t ho t "10	rally los	hic to k like	on inte	unit inval"	inte Defin	rval e a	(H) "web"	lint: to	what the ov be a	happent igin) space	s when e that	i we r i loca	remo ally
4 kri 5 (Chai fike	ore that llege) Rea either o	the UR that in interva	"tripod 1-ma	inijolds a tripe	are od,	spa for	is no nes tha instance	t ho t "10	rally lo	hic to k like	on inte Find	unit enval" two	inte Defin webs 1	rval . e a √₄, ₩₂	(H "web" with	lint: to two	what the ov be a "tripod	happeni 'givn) space points	s when e that cach	l we t Roca such	remo ally that
4 Kri 5 (Chai fike W1	ore that Nage) Rea either a and Wz	the US that in intervo are not	"tripod 1-ma 1, or homeon	a trips orphic	are od.	spa for tow	is no nes tha instance do you	t ho t "lo know	rally loc TD they	hic to k like ) aren4	on inte Find	unit enval" two	inte Defin webs 1	rval e a Va, Wz	(H "web" with	lint: to two	what fre ov be a Twipod	happen: 'gin) space points	e that	i we r Roca Such	remoi ally thai
4 Kri 5 (Chai fike W1	ore that Name) Reca either o and W2	the UR that intervo are not	"triped 1-ma 1, or homeom	wijolds a tripe wrph:c	are od.	spa for	is no nees tha instance do you	t "lo t "lo know	omeomorp radly loo they	hic to k like )	on inte Find	unit enal"	inte Defin webs 1	rval e a V₄, ₩₂	"web"	lint: to two	what the ov be a Thipod	happen: igin) space points	e that	we r Roca such	remo: ally thai
4 Kri 5 (Chai fike Ws	ore that llege) Rea either a and Wz	the UR that in intervo are not	"tripod 1-ma 9, or homeon	a tripe wrph.ic	are od.	spa for	is no nes tha instance do you	t ho t "lo kinow	memorp rally loc	hic to k like aren4	on inte Find F?	unit enal" two	inte Defin webs 1	rval . Va, Wz	(H "web"	lint: 5 to two	what the ov be a Thipod	happen 'givn') space points	s when e that cach	i we t r loca such	remo; ally thai
4 Kri 5 (Chai fike W1	ore that None) Reca either o and W2	the UR that in intervo are not	"triped 1-ma	a tripe worphic	od.	spa for	is no nees tha instance	t ho t "lo kinou	mesmorp rally loc they	hic to k like aren4	on inte Find F?	unit ernal two	inte Defin webs 1	rval. ≤ a	(H	lint: to	what the ov be a Thipod	happen Space	e that	i we t i loca such	remo; ally thei
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