Homework 3 - Manoel Z. Jarra

Ex 12

Let $f: \mathbb{R}^n \longrightarrow X$ be a continuous map.

Let $F: \mathbb{R}^n \times [0,1] \longrightarrow X$

$$(x, t) \longmapsto f(tx)$$

- F is clearly continuous,
- $F(\cdot, 0): \mathbb{R}^n \longrightarrow X$ is constant,
  $x \longmapsto f(0)$
- $F(\cdot, 1) = f$

$\therefore$ F is a homotopy between $cte = f(0)$ and f. $\square$

Ex 16:

I'll classify these letters here →

A B C D E F
G H I J K L M
N O P Q R S
T U V W X Y Z

There are 3 classes:

$\approx \cdot$	$\approx$ ◯	$\approx$ ◯◯
C K V	A	B
E L W	D	
F M X	O	
G N Y	P	
H S Z	Q	
I T	R	
J U		

contractible

"with one hole"

"with two holes"