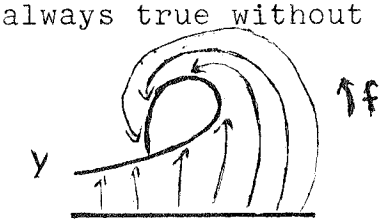
Caution: This is not always true without the assumptions on X and Y !!

Example:



$X = (0,1)$ (non-compact)

2.) Show that the map

$$f : [0,\infty) \to [0,\infty)$$
$$x \to +\sqrt{x}$$

is continuous.

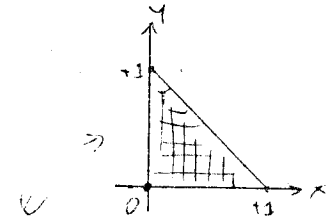
3.) Prove the following relations:

(i) $E^n \cong W^n \cong I^n \ncong \mathbb{R}^n$

(ii) $D^n \cong \mathbb{R}^n$

(iii) $S^n - \{\text{point}\} \cong \mathbb{R}^n$

(iv) $E^n/_{S^{n-1}} \cong S^n$

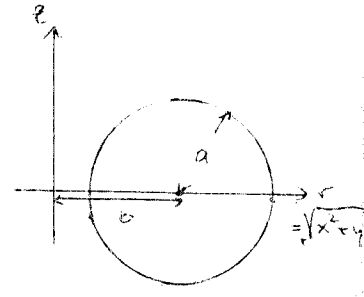


4.) Show that the triangle $\Delta = \{(x,y) \in \mathbb{R}^2 \mid x \geq 0,\ y \geq 0,\ x+y \leq 1\}$ is homeomorphic to the disk E^2.

5.) Let $a,b \in \mathbb{R}$, $0 < a < b$.

Show that the torus

$$T^2 = \{(x,y,z) \in \mathbb{R}^3 \mid (+\sqrt{x^2+y^2}-b)^2 + z^2 = a^2\}$$



is homeomorphic to $S^1 \times S^1$.

Show that T^2 can also be obtained as a quotient space by identifying opposite points on the parallel sides of a square.