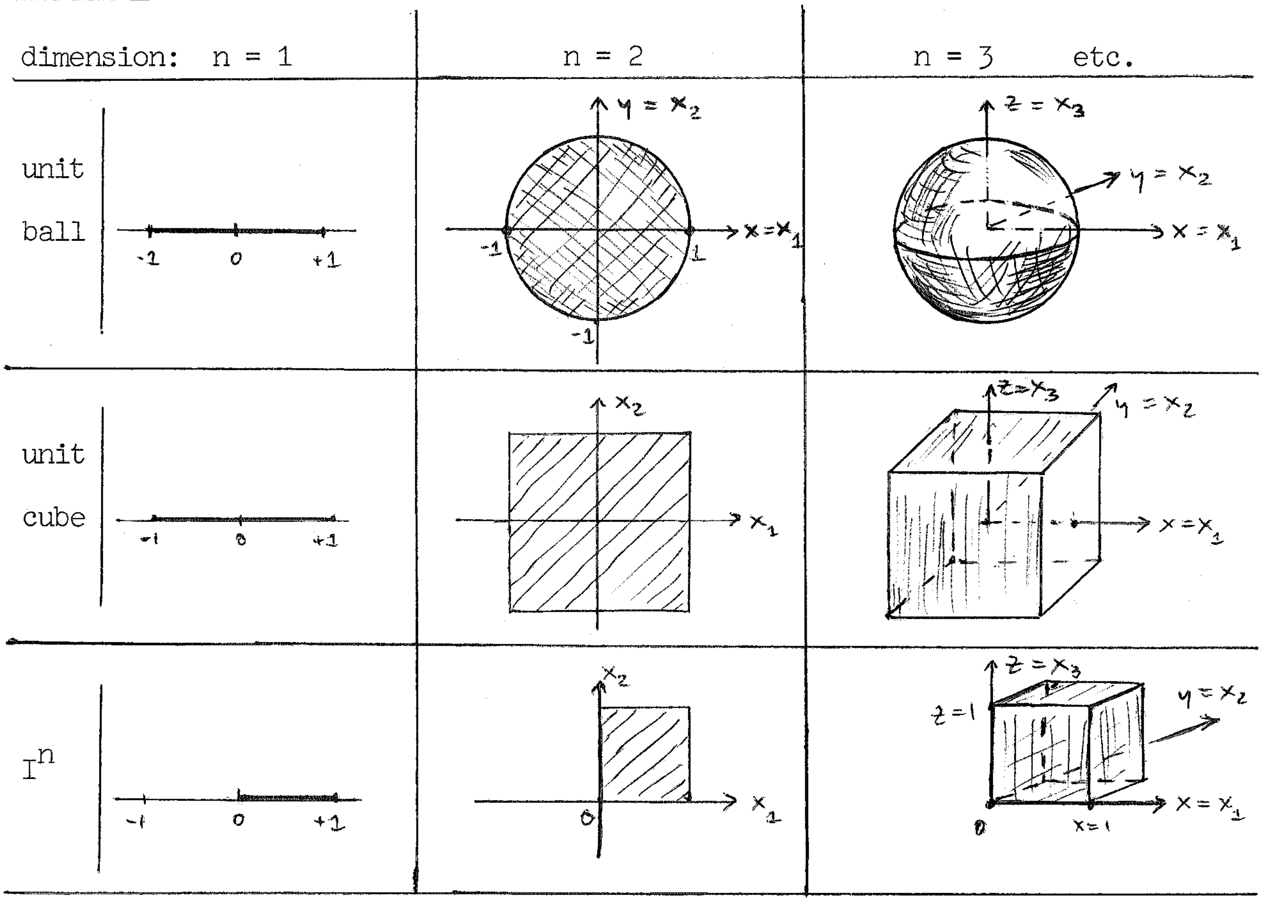
Sketch:



H. Homeomorphisms.

Let X and Y be topological spaces.

A map $f : X \to Y$ is called a homeomorphism if f is continuous and has a continuous inverse $g : Y \to X$ (i.e. $g \circ f = Id_X$, and $f \circ g = Id_Y$). Alternatively one can say that f is a homeomorphism iff f is one-to-one onto, continuous, and maps open subsets of X into open subsets of Y.

If $\exists$ a homeomorphism $f : X \to Y$, then X and Y are called "homeomorphic" or "topologically equivalent", and we write $X \cong Y$.

Problems:

1.) Let X be a compact space and Y be a Hausdorff space, and let $f : X \to Y$ be one-to-one onto and continuous. Show that f is already a homeomorphism.