

General Topology

Topology Without Tears, Morris
(available online)

Topics covered: topological spaces, the Euclidean topology, bases, limit points, connectedness, homeomorphisms, continuous mappings, compactness, product spaces

Image: homeomorphism between a cow and sphere



<http://www.cs.cmu.edu/~kmcrane/Projects/ModelRepository/>

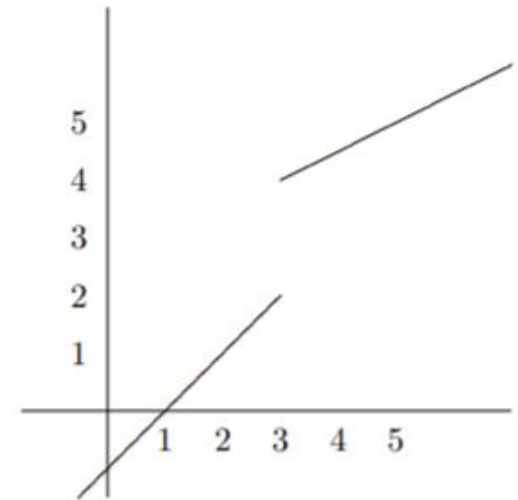
Directed Reading Program: Summer 2020
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Motivation: Abstracting from Real Analysis

A function $f : \mathbf{R} \rightarrow \mathbf{R}$ is said to be continuous iff:

- for each $a \in \mathbf{R}$ and each positive real number ϵ , there exists a positive real number δ such that $|x - a| < \delta$ implies $|f(x) - f(a)| < \epsilon$
- for each open subset U of \mathbf{R} , $f^{-1}(U)$ is an open set

$$f(x) = \begin{cases} x - 1, & \text{if } x \leq 3 \\ \frac{1}{2}(x + 5), & \text{if } x > 3. \end{cases}$$



Multiple ways to show function is discontinuous