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Concerning Two Properties of Connectivity Functions

Let X and Y be topological spaces and let $f:X \to Y$. Then:

D. : f is a <u>Darboux function</u> if $f(C)$ is connected whenever C is connected in X.

Conn. : f is a <u>connectivity function</u> if the graph of f restricted to C, denoted by $f|C$, is connected in $X \times Y$ whenever C is connected in X.

A.C. : f is an <u>almost continuous function</u> if $U \subset X \times Y$ is any open set containing the graph of f, then U contains the graph of a continuous function $g:X \to Y$.

Ext. : f is an <u>extendable function</u> if there exists a connectivity function $g:X \times [0,1] \to Y$ such that $f(x) = g(x,0)$ for each x in X.

Let $f:[a,b] \to R$ be a function. Then:

P.R. : f has a <u>perfect road</u> if for each x in $[a,b]$ there exists a perfect set P having x as a bilateral limit point such that $f|P$ is continuous at x. If x is an endpoint, then the bilateral condition is replaced with a unilateral condition.

For real-valued functions defined on an interval $[a,b]$ we have only the following implications among the classes of functions defined above.