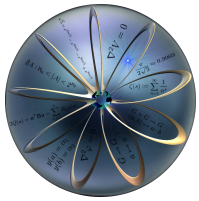

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Darboux's theorem (analysis)

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Synonym	intermediate value property of the derivative

Let $f : [a, b] \to \mathbb{R}$ be a real-valued continuous function on $[a, b]$, which is differentiable on (a, b), differentiable from the right at a, and differentiable from the left at b. Then f' the intermediate value theorem: for every t between $f'_+(a)$ and $f'_-(b)$, there is some $x \in [a, b]$ such that $f'(x) = t$.

Note that when f is continuously differentiable ($f \in C^1([a, b])$), this is trivially true *by* the intermediate value theorem. But even when f' is *not* continuous, Darboux's theorem places a severe restriction on what it can be.