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Continuity of order-preserving functions

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Abstract: Let the spaces $\mathbf{R}^m$ and $\mathbf{R}^n$ be ordered by cones P and Q respectively, let A be a nonempty subset of $\mathbf{R}^m$, and let $f : A \longrightarrow \mathbf{R}^n$ be an order-preserving function. Suppose that P is generating in $\mathbf{R}^m$, and that Q contains no affine line. Then f is locally bounded on the interior of A, and continuous almost everywhere with respect to the Lebesgue measure on $\mathbf{R}^m$. If in addition P is a closed halfspace and if A is connected, then f is continuous if and only if the range $f(A)$ is connected.

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