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David Gauld and **Frederic Mynard*** (fmynard@georgiasouthern.edu), Mathematical Sciences, POBox 8093, Georgia Southern University, Statesboro, GA 30460. *an update on differentiability as continuity.*

Differentiability of a map $f : \mathbb{R} \rightarrow \mathbb{R}$ cannot be characterized in terms of continuity of f by retopologizing \mathbb{R} , but it can be characterized in terms of continuity of a canonically associated map $\hat{f} : \hat{\mathbb{R}} \rightarrow \hat{\mathbb{R}}$. This requires to use convergence structures rather than only topologies on $\hat{\mathbb{R}}$. By modifying the convergence structures further, a similar result can be obtained for functions with tangents. The new convergence shows that the classical result that a function from a first-countable T_3 locally connected topological space into a Hausdorff space that preserves compact and connected sets is continuous does not extend to first-countable T -regular locally connected convergence spaces. Generalizations to the case of a function $f : X \rightarrow Y$ where X and Y are normed spaces are discussed. (Received August 29, 2008)