Let $K$ be a D-domain, and let $f : K \to \mathbb{R}$ be differentiable at $x \in K$. Then $f$ is continuous at $x$.

Assume as above. Then by definition 9.2.1, the limit at $x$ exists, and is equal to $\lim_{y \to x} \frac{f(y) - f(x)}{y - x} = f'(x)$. So define $g(y) = \begin{cases} \frac{f(y) - f(x)}{y - x}, & \text{for } y \neq x, \\ f'(x), & \text{for } y = x \end{cases}$. Then $g(y_n) \to f'(x)$, and by theorem 4.3.3, $g$ is continuous. Further, $g(y)(y - x) = f(x) - f(y)$, which implies that $f(x) = \lim_{y \to x} f(y)$. So $f$ is also continuous.