A closed unbounded $*$-derivation on a C^*-algebra A.

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Suppose that $A = C([0,1])$ and $\delta(f) = (\frac{d}{dt})f(t) = f'(t)$ with the domain $D(\delta) = C^1([0,1])$ where $C^1([0,1])$ is the algebra of all continuously differentiable functions on $[0,1]$. $\| \delta(x^n) \| = n = n \| x^n \|$ implies that δ is an unbounded derivation from $D(\delta)$ into A. If $f_n \in D(\delta), f_n \longrightarrow f \in A$, and $\delta(f_n) \longrightarrow g$, then $f_n' \longrightarrow g$ uniformly on $[0,1]$ and $f_n(0) \longrightarrow f(0)$. So g is differentiable and $f' = g$. Therefore $f \in D(\delta)$ and $\delta(f) = g$.