Quiz 3

MATH 140B

MSTB 124

NAME (2 POINTS):

Problem 1. (4 points) Show that if $\sum_{k=0}^{\infty} g_k$ and $\sum_{k=0}^{\infty} h_k$ converge uniformly on $[a, b]$ then so does $\sum_{k=0}^{\infty} g_k + h_k$.

Problem 2. (4 points) Give an example of a sequence of continuously differentiable functions $\{f_n\}$ on $(0, 1)$ which converges uniformly to 0, but such that the sequence of derivatives $\{f_n\}$ does not converge to 0. Hint: consider starting with a bounded function $f(x)$ which oscilates more and more rapidly as $x \to 0$.