**Math 3333**                              Name:

## Quiz/HW 4

Please, write clearly and justify all your statements using the material covered in class to get credit for your work.

(1) [6 Pts] Let $(s_n)$ be a sequence such that $\lim_{n\to\infty} s_n = 0$ and $(t_n)$ be a bounded sequence. Prove that the sequence $(s_n t_n)$ is convergent.

(2)[2 Pts] Prove or give a counterexamples:
(a) If $(s_n)$ and $(t_n)$ are divergent sequences, then $(s_n + t_n)$ diverges.

(b) If $(s_n)$ is convergent and $(t_n)$ is bounded, then $(s_n t_n)$ converges.