Math 3333

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.