

**Problem 5.** For any two real sequences  $\{a_n\}, \{b_n\}$ , prove that

$$\limsup_{n \rightarrow \infty} (a_n + b_n) \leq \limsup_{n \rightarrow \infty} a_n + \limsup_{n \rightarrow \infty} b_n.$$

**Problem 7.** Prove that the convergence of  $\sum a_n$  implies the convergence of

$$\sum \frac{\sqrt{a_n}}{n},$$

if  $a_n \geq 0$ .

**Problem 8.** If  $\sum a_n$  converges, and if  $\{b_n\}$  is monotonic and bounded, prove that  $\sum a_n b_n$  converges.

*Proof.*

□