

## Exercise 5

Prove the *Schwarz inequality for infinite series*:

$$\sum a_n b_n \leq \left( \sum a_n^2 \right)^{1/2} \left( \sum b_n^2 \right)^{1/2}.$$

(*Hint*: See the hint in Exercise 2. Prove it first for finite series (ordinary sums) and then pass to the limit.)