

Exercise 2

Prove the *Schwarz inequality* (for any pair of functions):

$$|(f, g)| \leq \|f\| \cdot \|g\|.$$

(*Hint:* Consider the expression $\|f + tg\|^2$, where t is a scalar. This expression is a quadratic polynomial of t . Find the value of t where it is a minimum. Play around and the Schwarz inequality will pop out.)