MATB24. Quiz #5, TUT # 21

(1) (4 point) In each part, give a complete definition, or mathematical characterization of the word in bold.
   (a) The **Cauchy-Schwarz inequality** for an inner product space V

(2) (3 point) Give an example **(with justification)** of a mathematical object that satisfies all the described properties or explain why such an example does not exists.
   (a) An inner product on $\mathbb{R}^3$ other than the dot product.

(3) (8 point) Carefully prove the following.
   (a) V= the space of continuous functions from $[-2, 2]$ to $\mathbb{R}$, is an inner product space defined by

$$\langle f, g\rangle = \frac{1}{\pi}\int_{-2}^{2} f(t)g(t)dt.$$