



Definition

The *variance* of a square-integrable real-valued random variable is the expectation of its square less its expectation squared.

Notation

Suppose $f : X \rightarrow \mathbf{R}$ is a random variable on a probability space (X, \mathcal{A}, P) . We denote the variance of f by $\text{var } f$, so that

$$\text{var } f = \mathbf{E}(f^2) - (\mathbf{E}(f))^2.$$

Results

Proposition 1. *If a random variable on a probability space is square integrable then it is integrable.*

Proof. The L^p spaces are nested for finite measures. □

Proposition 2. *The variance of a square-integrable real-valued random variable is the expectation of the square of the difference between the random variable and its expectation.*

