



## Why

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## Definition

The *expectation* (or *expected value*) of a real-valued random variable defined on a probability space is its integral with respect to the probability measure. The expectation of a random variable is also called its *mean*.

## Notation

Let  $(X, \mathcal{A}, \mu)$  be a probability space and  $f : X \rightarrow \mathbf{R}$  be a random variable. We denote the expectation of  $f$  by  $\mathbf{E}f$ , defined:

$$\mathbf{E}f = \int f d\mu.$$

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<sup>1</sup>Future editions will include this.



