



## Expectation

### 1 Why

TODO

### 2 Definition

The *expectation* of a real-valued random variable defined on a probability space is its integral with respect to the probability measure.

#### 2.1 Notation

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

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