



## Real Probability Densities

### 1 Why

We want to talk about probability on the set of outcomes which is the real numbers.

### 2 Definition

A *probability density* or *probability density function* is a real-valued function on the reals which is nonnegative and normalized. A real-valued function on the reals is *normalized* if it integrates to 1.

### 3 Notation

Let  $f : \mathbf{R} \rightarrow \mathbf{R}$  with  $f \geq 0$  and  $\int f = 1$ . Then  $f$  is a probability density.