probability density function

probability density function

probability density function

A random variable X is continuous if there is a nonnegative function $f(x)$, called the probability density function (pdf) of X, such that

$$P(X \in A) = \int_A f(x)dx$$

for every subset of A of the real line. Specifically, the probability that X is in an interval is

$$P(a \leq X \leq b) = \int_a^b f(x)dx$$

For any PDF we know that $f(x) \geq 0$ for all values of x and the total area under the whole graph is 1

$$\int_{-\infty}^{\infty} f(x)dx = 1$$

Note: $P(a \leq X \leq b) = P(a < X \leq b) = P(a \leq X < b) = P(a < x < b)$

probability density function