Try it yourself

What is the CDF of X where

X be the largest value among the three balls. (Drawing 3 of the 20 without replacement)

Two descriptions

PROBABILITY MASS FUNCTION	CUMULATIVE DISTRIBUTION FUNCTION
Defined for all $\mathbb{R}$ inputs.	Defined for all $\mathbb{R}$ inputs.
Usually has "0 otherwise" as an extra case.	Often has "0 otherwise" and 1 otherwise" extra cases
$\sum_x p_X(x) = 1$	Non-decreasing function
$0 \leq p_X(x) \leq 1$	$0 \leq F_X(x) \leq 1$
	$\lim_{x \to -\infty} F_X(x) = 0$
$\sum_{z:z\leq x} p_X(z) = F_X(x)$	$\lim_{x \to \infty} F_X(x) = 1$

Expectation

Expectation

The "expectation" (or "expected value") of a random variable X is:

$$\mathbb{E}[X] = \sum_k k \cdot \mathbb{P}(X = k)$$

Intuition: The weighted average of values X could take on.

Weighted by the probability you actually see them.

Try it yourself

Let X be the result shown on a fair die. What is $\mathbb{E}[X]$?

Let Y be the sum of two (independent) fair die rolls. What is $\mathbb{E}[Y]$?

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knows how long to explain
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