Example: Let $X$ denote the number of girls born in 4 independent births. Notice $X$ takes on 5 possible values: 0, 1, 2, 3, 4.

16 possible outcomes.

- 1 outcome $\to X = 0$: $P(X = 0) = \frac{1}{16}$
- 4 outcomes $\to X = 1$: $P(X = 1) = \frac{4}{16}$
- 6 outcomes $\to X = 2$: $P(X = 2) = \frac{6}{16}$
- 4 outcomes $\to X = 3$: $P(X = 3) = \frac{4}{16}$
- 1 outcome $\to X = 4$: $P(X = 4) = \frac{1}{16}$

Mass $p_X(x)$ of the random variable $X$ looks like:

$$P(X = x) = 0 \text{ for all other values of } X$$

often leave off the 0 values altogether.

CDF $F_X(x)$ of random variable $X$

Think: CDF approaches 0 as $x \to -\infty$ i.e. to the left.

approaches 1 as $x \to +\infty$ i.e. to the right.

has step sizes of the same height as the mass.

Because the mass must sum to 1.