

$$\mathbb{P}(X \leq x) = \frac{\int_{-\infty}^x f(x) dx}{\int_{-\infty}^{\infty} f(x) dx}$$

$$p_X(x) = \frac{d}{dx} \mathbb{P}(X \leq x) = \frac{f(x)}{\int_{-\infty}^{\infty} f(x) dx}$$

