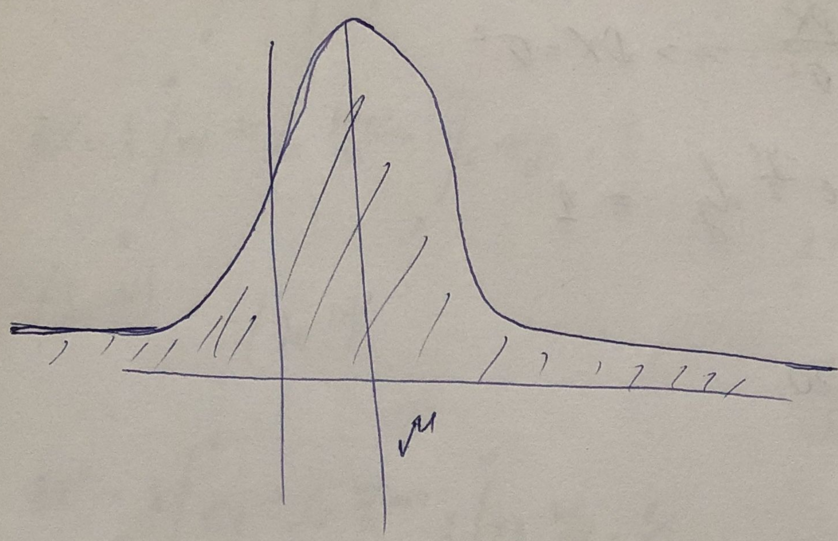
Б/ Нормално разпределение

$X \sim N(\mu, \sigma^2)$ $\mu \in \mathbb{R}$

$\sigma^2 > 0$

Ако $f_X(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{-(x-\mu)^2}{2\sigma^2}}$ $\forall x \in \mathbb{R}$



$$\frac{1}{\sigma\sqrt{2\pi}} \int_{-\infty}^{\infty} e^{\frac{(x-\mu)^2}{2\sigma^2}} dx = 1$$

$$F_X(x) = \frac{1}{\sigma\sqrt{2\pi}} \int_{-\infty}^{\infty} e^{\frac{-(x-\mu)^2}{2\sigma^2}} dx$$

$$\cancel{Y = \frac{1}{\sigma}(X-\mu) \sim N(0,1)}$$

$X \sim N(\mu, \sigma^2)$, ако $Y = \frac{X-\mu}{\sigma} \sim N(0,1)$ и се нарича стандартно нормално разпр.

$g(x) = \frac{x-\mu}{\sigma}$ е $\uparrow$

$h(y) = \sigma y + \mu$

$h'(y) = \sigma$

$f(y) = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{-(\sigma y + \mu - \mu)^2}{2\sigma^2}} \sigma = \frac{1}{\sqrt{2\pi}} e^{\frac{-y^2}{2}}$ $\forall y \in (-\infty, \infty)$