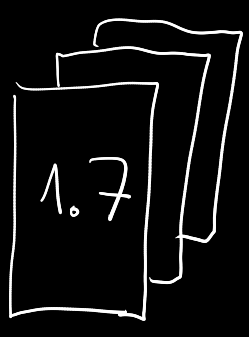
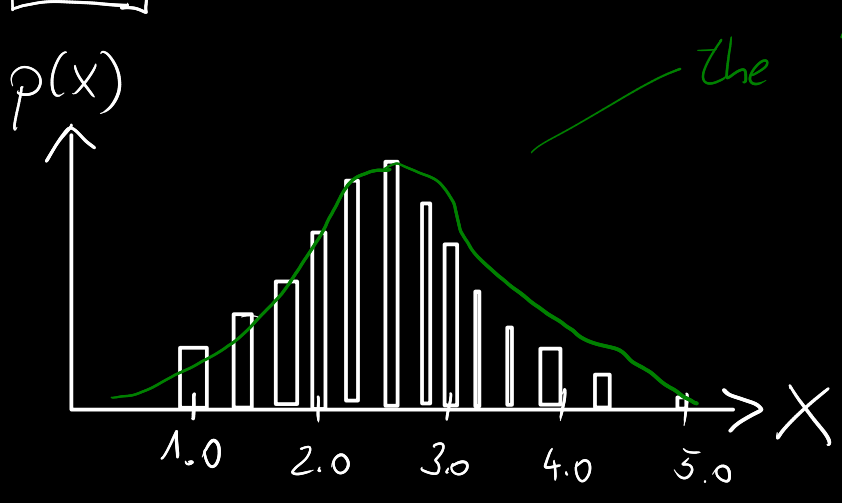
Gaussion / Normal Distribution - Intro





the "bell-curve"

→ position?

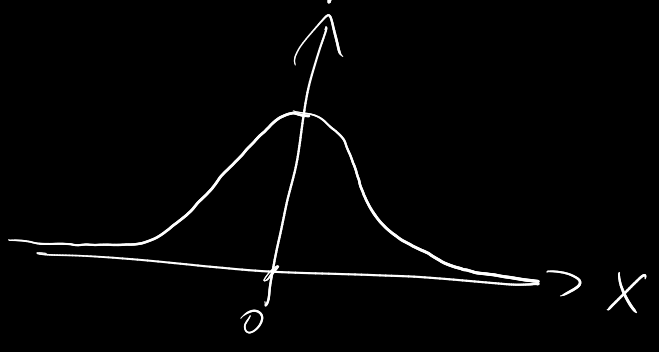
→ scale?

How can we get the bell shape?

Here: special case of univariate, that X is one-dimensional (≙ a scalar)

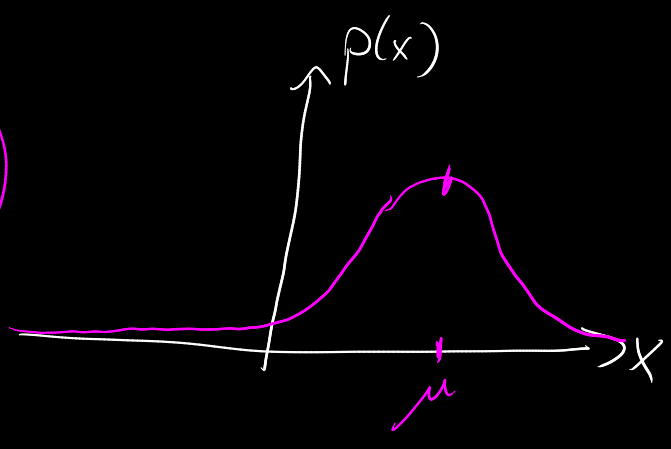
p(x) is only 0 at ±∞

$$p(x) \sim \exp(-x^2)$$



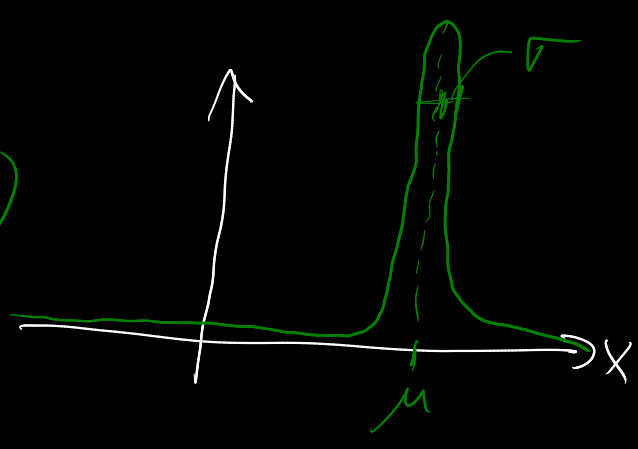
Move to left & right?

$$p(x) \sim \exp(-(x-\mu)^2)$$



Change the shape?

$$p(x) \sim \exp\left(-\frac{1}{\sigma^2}(x-\mu)^2\right)$$



Normalize?

$$p(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left(-\frac{1}{2\sigma^2}(x-\mu)^2\right)$$

Parameters of the Normal

μ ... mean (center) (pos)

σ ... standard deviation (Scale)

Shorthand:

$$X \sim p(x) = \mathcal{N}(\mu, \sigma)$$

the grades $X \sim \mathcal{N}(2.5, 1.0)$