

$$\hat{F}(x) = \frac{\#\{x_k : x_k \leq x\}}{N}$$

$x_1, x_2, \dots, x_k, \dots, x_N$

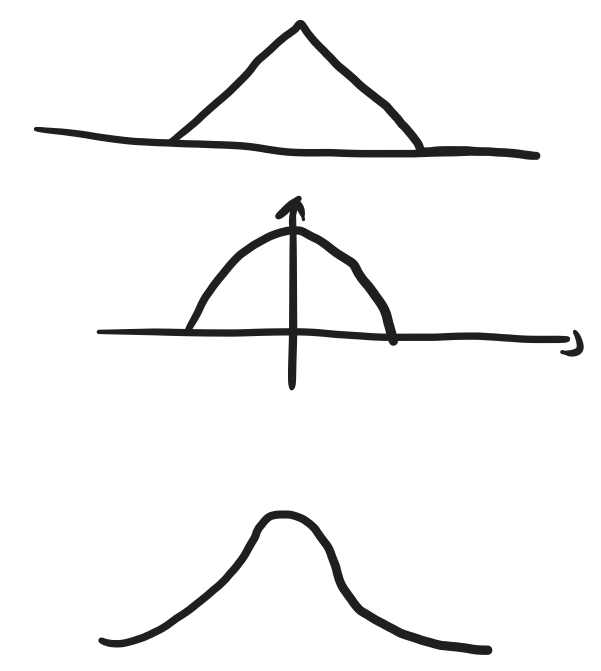
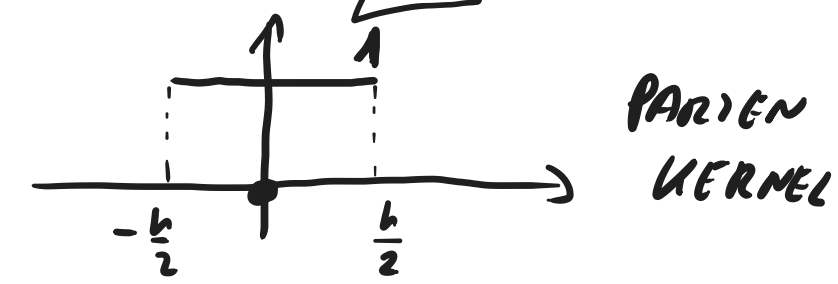
$$F'(x) = f(x)$$

$$\hat{f}(x) = \frac{\hat{F}(x + \frac{h}{2}) - \hat{F}(x - \frac{h}{2})}{h}$$

$N \rightarrow \infty$
 $h \rightarrow 0$ $Nh \rightarrow \infty$

$\leadsto f(x)$ ^{unknown}

$$I(x_k) = \begin{cases} 1 & \text{if } |x_k - x| \leq \frac{h}{2} \\ 0 & \text{elsewhere} \end{cases}$$



$$f(x) = \sum_{i=1}^{\infty} a_i \varphi_i(x)$$

$a_1, a_2, \dots, a_5, \dots$ ^{unknown}