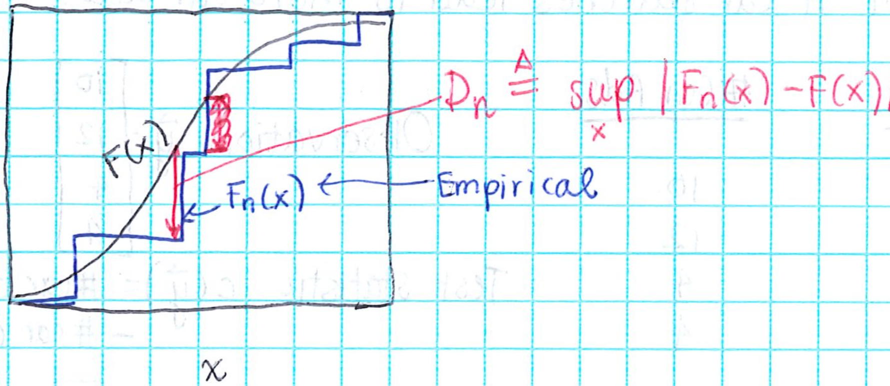
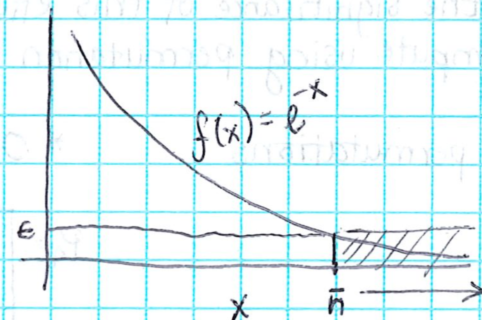
Last time: Kolmogorov-Smirnov Test



Glivenko-Cantelli: If $X_i \sim F(x)$, $D_n \xrightarrow{a.s.} 0$

Limits of functions:



$\lim_{x \to \infty} f(x) = 0$

$\forall \epsilon, \exists \bar{n}: \forall x > \bar{n}$

$e^{-x} < \epsilon$

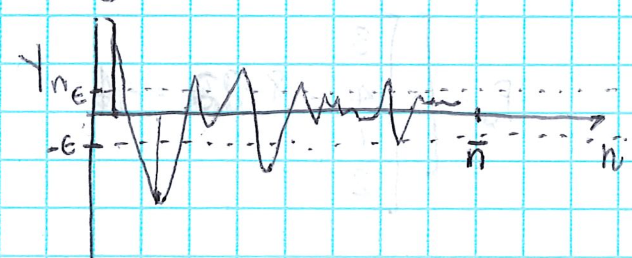
<u>Def</u>: We say $\lim_{x \to \infty} f(x) = L$

iff $\forall \epsilon, \exists \bar{n}$ s.t. $\forall x > \bar{n}$
$|f(x) - L| < \epsilon$.

What if we have a random process?

<u>Ex.</u> $X_1, X_2, \ldots$ $X_i \sim \mathcal{N}(0, \sigma^2)$ Define $Y_n \triangleq \frac{\sum_{i=1}^{n} X_i}{n}$

Intuitively: What does Y_n converge to?



Def. We say Y_n converges <u>almost surely</u> to Y iff

$Pr\left(\lim_{n \to \infty} Y_n = Y\right) = 1$. Write this as $Y_n \xrightarrow{a.s.} Y$.