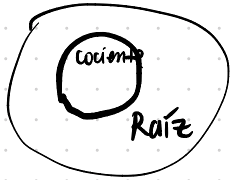
Clase repaso

Bernardita Rosas

$(a_n)_n$ sucesión

$$\lim_{n\to\infty} \frac{|a_{n+1}|}{|a_n|} < 1 \Rightarrow \lim_{n\to\infty} \sqrt[n]{|a_n|} < 1$$



1) $$\int_0^\infty t^{x-1} e^{-t}\, dt = \Gamma(x)$$

si $x > 0 \Leftarrow$

$x - 1 > 0 \Leftrightarrow x > 1$

$$\Gamma(x) = \int_0^1 t^{x-1} e^{-t}\, dt + \int_1^\infty t^{x-1} e^{-t}\, dt$$

$$\lim_{t\to\infty} \frac{t^{x-1} e^{-t}}{e^{-t}} = \lim_{t\to\infty} t^{x-1} = 0 \Leftrightarrow 0 \leq x \leq 1$$

$$\int_1^\infty e^{-t}\, dt \text{ cv} \Rightarrow I_2 \text{ cv } (0 \leq x \leq 1)$$

$$\lim_{t\to\infty} \frac{t^{x-1}}{t^{-2}} e^{-t} = \lim_{t\to\infty} \frac{t^{x+1}}{e^t} = 0$$

$\forall x \in \mathbb{R}$

$\int_1^\infty t^{-2}\, dt \ \underline{\underline{CV}} \implies \int_1^\infty t^{x-1} e^{-t}\, dt \ \underline{\underline{CV}}$

$\forall x \in \mathbb{R}$

$I_1)$ $\int_0^1 t^{x-1} e^{-t}\, dt$

$0 < t < 1$

$t^{x-1} \cdot e^{-t} \leq t^{x-1}$

$= \int_0^1 t^{x-1}\, dt = \int_0^1 \frac{1}{t^{1-x}}\, dt$ CV

$\iff 0 < 1-x < 1$

$0 \leq 1 - x < 1$

$-x < 0$

$0 < 1 - x < 1$ $\iff x > 0$

$0 < x$

$x > 0$ $0 < x-1 < 1$

$0 < x < 2$