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1. [3 pt] Demuestre utilizando la definición de convergencia para sucesiones:

a)
$$\lim_{n \to \infty} \frac{n^2}{n!} = 0.$$

Sug: Argumente de forma coherente que $\frac{n^2}{n!} \leq \frac{1}{n-3}$, para $n \geq 4$ en \mathbb{Z}^+ .

$$b) \lim_{n \to \infty} \frac{n+1}{2n+5} = \frac{1}{2}$$

$$\frac{\partial}{\partial x} = \frac{\partial}{\partial x} = \frac{\partial}{\partial x}$$

Moster fre
$$\frac{n^2}{n!} \leq \frac{1}{n-3}$$
 para $n \geq 4$ en \mathbb{Z}^{+}

$$\frac{\Omega^2}{\Omega!} = \frac{\Delta}{\Lambda - 1!} \leq \frac{1}{\Lambda - 3}$$

$$V(V-3) \leq V-1$$

$$(N-3) \leq (N-1) \cdot (N-2) \cdot (A-3) \cdot (1)$$

$$0 \leq (n-1)(n-2) \leq (n-1)(n-2)(n-3)...(1)$$

$$(7.5)$$
 (2)

$$(K-1)(K-2)$$
 $(K-2)$
 $(K-2)$
 $(K-2)$

$$k+1 = k^{2} - k$$

$$2k+1 \leq k^{2}$$

$$P(b)$$

$$2(1)+1 \leq (d)^{2}$$

$$q \leq 16$$

$$+(1)$$

$$2m+1 \neq 2 \leq m^{2} + 2 \geq (m+1)^{2}$$

$$2m+3 \leq m^{2} + 2 \leq (m+1)^{2}$$

$$2(m+1)+1 \leq m^{2} + 2 \leq m^{2} + 2 \leq (m+1)^{2}$$

$$2(m+1)+1 \leq m^{2} + 2 \leq m^{2} + 2 \leq (m+1)^{2}$$

$$2(m+1)+1 \leq m^{2} + 2 \leq ($$

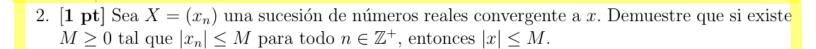
$$b) \lim_{n \to \infty} \frac{n+1}{2n+5} = \frac{1}{2}$$

Veg que
$$\frac{3}{200}$$
 $\frac{3}{4000}$ esto porque

$$\frac{3}{0} > \frac{3}{40} > \frac{3}{4010} > 0$$
 (2)

$$\left| \frac{0+1}{20+5} - \frac{1}{2} \right| = \left| \frac{20+2}{40+10} - \frac{5}{5} \right|$$

$$= \left| \frac{-3}{4n+10} \right| = \frac{3}{4n+10} < \frac{3}{6} < \frac{3}{6} < \frac{3}{6} < \frac{3}{6}$$



$$|\chi_{n}| \leq M$$

$$-M \leq \chi_{n} \leq M$$

$$\lim_{N \to \infty} -M \leq \lim_{N \to \infty} \chi_{n} \leq \lim_{N \to \infty} M$$

$$\lim_{N \to \infty} -M \leq \chi \leq M$$

$$|\chi| \leq M$$

3. [1 pt] Demuestre utilizando directamente de la definición de sucesión de Cauchy, que si $X = (x_n)$ es una sucesión de Cauchy y $c \neq 0$, entonces (cx_n) es una sucesión de Cauchy.

$$|c| |\chi_n - \chi_m| = |c(\chi_n - \chi_m)| < \varepsilon$$