Taller Oscar eduardo.

2.

m) $\lim_{x\to\infty} \left(\sqrt{x^2} - \sqrt{x+1^2} \right)$

$\lim_{x\to\infty} \left(\sqrt{x^2} - \sqrt{x+1^2} \right)$

Racionalizar.

$$\lim_{x\to\infty} \left(\sqrt{x^2} - \sqrt{x+1^2} \cdot \frac{\sqrt{x^2} + \sqrt{x+1^2}}{\sqrt{x^2} + \sqrt{x+1^2}} \right)$$

$$\lim_{x\to\infty} \frac{x - (x+1)}{\sqrt{x^2} + \sqrt{x+1^2}}$$

$$\lim_{x\to\infty} -\frac{1}{\sqrt{x^2} + \sqrt{x+1^2}}$$

$$-\lim_{x\to\infty} \frac{1}{\sqrt{x^2} + \sqrt{x+1^2}} \cdot -\left(\frac{1}{\sqrt{\infty^2} + \sqrt{\infty+1^2}} \right)$$

$$= -\left(\frac{1}{\infty} \right) = 0$$

Articulo No. 3

k) $\lim_{x\to 0} \left(\frac{1}{x} - \frac{1}{|x|} \right)$

$$f(x) = |x| = \begin{cases} x, & \text{Si } x \geq 0 \\ -x, & \text{Si } x < 0 \end{cases}$$

$\lim_{x\to 0^-} \left(\frac{1}{x} - \frac{1}{-x} \right)$

$\lim_{x\to 0^-} \left(\infty + \infty \right) = \infty$

$\lim_{x\to 0^+} \left(\frac{1}{x} - \frac{1}{x} \right)$

$\lim_{x\to 0^+} (0) = 0$

Es divergente.

8.

a) $\lim_{x\to 0} x^3 \cos\left(\frac{1}{x}\right) \overset{\Downarrow}{=} 0$

$0^3 \cos\left(\frac{1}{0}\right) \cdot 0 \cos(\infty) \longrightarrow$

$-1 \leq \cos\left(\frac{1}{x}\right) \leq 1 \quad / (x^3)$

$-x^3 \leq x^3 \cos\left(\frac{1}{x}\right) \leq x^3$

$-\lim_{x\to 0} x^3 = 0$

$\lim_{x\to 0} x^3 = 0$

c. $\lim_{x\to\infty} \frac{Sen^2 x}{x^2} = 0$

$\Downarrow$

$\frac{Sen^2(\infty)}{\infty}$

$\lim_{x\to\infty} 0 \cdot 0$, $\lim_{x\to\infty} \frac{1}{x^2} = 0$

$0 \leq Sen^2 x \leq 1 \;/\; \frac{1}{x^2} \rightarrow 0 \leq Sen^2 x \leq \frac{1}{x^2}$

Obs: Si $f(x) = Sen^n x$, esta f esta acotada

entre $-1 \leq Sen^n x \leq 1$, Con $n = 2k+1$

$0 \leq Sen^n x \leq 1$, Con $n = 2k$