

abr. 11)

$$a) \lim_{x \rightarrow 0} \frac{\sqrt{|x - \sin x|}}{x}$$

Ar $x > 0 \Rightarrow x > \sin x \rightarrow x - \sin x > 0$

Ar $x < 0 \Rightarrow x - \sin x < 0$

$$\lim_{x \rightarrow 0^+} \frac{\sqrt{x - \sin x}}{x} = \lim_{x \rightarrow 0^+} \sqrt{\frac{x - \sin x}{x^2}} = \lim_{u \rightarrow 0^+} \sqrt{u} = 0$$

$$\lim_{x \rightarrow 0^+} \frac{x - \sin x}{x^2} = \lim_{x \rightarrow 0^+} \frac{1 - \cos x}{2x} = \lim_{x \rightarrow 0^+} \frac{\sin x}{2} = 0$$

Opotim $\lim_{x \rightarrow 0^-} \frac{\sqrt{x - \sin x}}{x} = 0$

$$b) \lim_{x \rightarrow 0^-} \frac{\sqrt[3]{\sin x - x}}{x} = \lim_{x \rightarrow 0^-} \frac{\sqrt[3]{\sin x - x}}{\sqrt[3]{(-x)^3}}$$

$$(r) \lim_{x \rightarrow +\infty} \left(x^2 \sin \frac{1}{x} - x \right) \stackrel{\frac{1}{x} = u}{=} \lim_{u \rightarrow 0^+} \left(\frac{1}{u^2} \sin u - \frac{1}{u} \right) =$$

$$\lim_{u \rightarrow 0^+} \frac{\sin u - u}{u^2} \stackrel{DLH}{=} \dots = 0$$