

CORRECTION DU TEST N°017

Exercice 1 :

Rappeler les limites suivantes

$$\lim_{x \rightarrow +\infty} e^x = +\infty$$

$$\lim_{x \rightarrow +\infty} \frac{1}{x} = \mathbf{0}$$

$$\lim_{x \rightarrow -\infty} e^x = \mathbf{0}$$

$$\lim_{x \rightarrow 0^+} \frac{1}{x} = +\infty$$

$$\lim_{x \rightarrow +\infty} \ln(x) = +\infty$$

$$\lim_{x \rightarrow 0^-} \frac{1}{x} = -\infty$$

$$\lim_{x \rightarrow 0^+} \ln(x) = -\infty$$

Exercice 2 :

Déterminer les limites des fonctions suivantes au point a

1- $f(x) = 3 - 2x - 3x^3$ $a = +\infty$

$$\lim_{x \rightarrow +\infty} f(x) = \lim_{x \rightarrow +\infty} (-3x^3) = -\infty$$

2- $f(x) = 3 - 2x - 3x^3$ $a = 1$

$$\lim_{x \rightarrow 1} f(x) = 3 - 2 - 3 = -2$$

3- $f(x) = x^2 - 2x + e^x$ $a = +\infty$

$$\lim_{x \rightarrow +\infty} f(x) = +\infty \text{ car } \begin{cases} \lim_{x \rightarrow +\infty} (x^2 - 2x) = \lim_{x \rightarrow +\infty} x^2 = +\infty \\ \lim_{x \rightarrow +\infty} e^x = +\infty \end{cases}$$

$$4- f(x) = \frac{\ln(x)}{x} \quad \alpha = 0^+$$

$$\lim_{x \rightarrow 0^+} f(x) = -\infty \text{ car } \begin{cases} \lim_{x \rightarrow 0^+} \ln(x) = -\infty \\ \lim_{x \rightarrow 0^+} x = 0^+ \end{cases}$$

$$5- f(x) = \frac{2x+1}{x-2} \quad a = -\infty$$

$$\lim_{x \rightarrow -\infty} f(x) = \lim_{x \rightarrow -\infty} \frac{2x}{x} = \lim_{x \rightarrow -\infty} 2 = 2$$

6- $f(x) = \frac{2x+1}{2-x}$ $a = 2$

signe de $2-x$: $\xrightarrow{+} \textcircled{\ominus} \xrightarrow{-}$

$$\lim_{x \rightarrow 2^+} f(x) = -\infty \quad \text{car} \quad \begin{cases} \lim_{x \rightarrow 2^+} (2x+1) = 5 \\ \lim_{x \rightarrow 2^+} (2-x) = 0^- \end{cases}$$

$$\lim_{x \rightarrow 2^-} f(x) = -\infty \quad \text{car} \quad \begin{cases} \lim_{x \rightarrow 2^-} (2x+1) = 5 \\ \lim_{x \rightarrow 2^-} (2-x) = 0^+ \end{cases}$$

$$7- \quad f(x) = x + e^{-x}$$

$$a = +\infty$$

$$\lim_{x \rightarrow +\infty} f(x) = +\infty \text{ car } \begin{cases} \lim_{x \rightarrow +\infty} x = +\infty \\ \lim_{x \rightarrow +\infty} e^{-x} = 0 \end{cases}$$