

Sommaire**II- Exercices I****2-1/ Exercice 1-1****2-2/ Exercice 1-2****2-3/ Exercice 1-3****2-4/ Exercice 1-4****II- Exercices I****2-1/ Exercice 1-1**

Calculer les limites suivantes :

$$\begin{aligned}1 & \lim_{x \rightarrow 4} \frac{|x^2 - 2x| - 8}{x^2 - 5x + 4} \\2 & \lim_{x \rightarrow +\infty} \frac{\sqrt{x^2 + x + 1} - \sqrt{x^2 - 4}}{x + \sqrt{x + 2}} \\3 & \lim_{x \rightarrow -\infty} \sqrt{x^4 - x^3} - x^2 \\4 & \lim_{x \rightarrow +\infty} x \sqrt{4x^2 + 3x - 7} - 2x^2\end{aligned}$$

**2-2/ Exercice 1-2**

Calculer les limites suivantes :

$$\begin{aligned}1 & \lim_{x \rightarrow -\infty} \frac{\sqrt{10x^2 + 9} - 7}{\sqrt{2-x} + \sqrt{x^2 + 5} - 5} \\2 & \lim_{x \rightarrow -\infty} \frac{\sqrt{x^4 + 1} - \sqrt{x^4 - 1}}{\sqrt{x^2 + 1} - \sqrt{x^2 - 1}} \\3 & \lim_{x \rightarrow +\infty} \sqrt{x^3 + \alpha x^2 + x + 1} \quad (\alpha \in \mathbb{R}) \\4 & \lim_{x \rightarrow \alpha^+} \frac{\sqrt{x^2 - \alpha x} + \sqrt{x^2 - \alpha^2}}{\sqrt{x - \alpha}} \quad (\alpha \in \mathbb{R})\end{aligned}$$

**2-3/ Exercice 1-3**

Calculer les limites suivantes :

$$\begin{aligned}
 1 & \lim_{x \rightarrow \frac{\pi}{4}} \frac{x+x \cos 4x}{\sin x - \cos x} \\
 2 & \lim_{x \rightarrow \frac{\pi}{2}} \frac{2 \tan 2x - \sqrt{3} \cos x}{\pi - 2x} \\
 3 & \lim_{x \rightarrow \frac{\pi}{2}} \left( x \tan x - \frac{\pi}{2 \cos x} \right) \\
 4 & \lim_{x \rightarrow \frac{\pi}{3}} \frac{\sqrt{3} \sin x - \cos x - 1}{2 \cos x + \cos 3x}
 \end{aligned}$$

## 2-4/ Exercice 1-4

Calculer les limites suivantes :

$$\begin{aligned}
 1 & \lim_{x \rightarrow \frac{\pi}{2}} \left( \frac{\pi}{2} - x \right) \tan x \\
 2 & \lim_{x \rightarrow 1} (2 - 3x + x^2) \tan \left( \frac{\pi}{2} x \right) \\
 3 & \lim_{x \rightarrow +\infty} (x^2 + x - 1) \sin^2 \left( \frac{1}{x} \right) \\
 4 & \lim_{x \rightarrow \frac{\pi}{4}} \frac{\cos^3 x - \sin^3 x}{\sin \left( \frac{\pi}{4} - x \right)} \\
 5 & \lim_{x \rightarrow 0} \frac{\cos ax - \cos bx}{x^2} \quad ((a, b) \in \mathbb{R}^2)
 \end{aligned}$$