

EXERCICE 1 :

Calculer les limites suivantes :

$$\begin{aligned}
 &1) \lim_{x \rightarrow 1} \frac{2x^2 + x - 3}{x - 1} \quad 2) \lim_{x \rightarrow 4} \frac{x^2 - 16}{2x - 8} \quad 3) \lim_{x \rightarrow 0} \frac{x^3 + x^2}{4x^3 - 2x^2} \quad 4) \lim_{x \rightarrow 1} \frac{2x^2 - 2}{3x - 3} \quad 5) \lim_{x \rightarrow 2} \frac{x^3 - 3x^2 + 4}{x^2 - 5x + 6} \\
 &6) \lim_{x \rightarrow 1} \frac{2x^4 + x - 3}{x - 1} \quad 7) \lim_{x \rightarrow 0} \frac{3x - 1}{x^2} \quad 8) \lim_{x \rightarrow 1^+} \frac{1 + x^2}{(x - 1)(4 - x)} \quad 9) \lim_{x \rightarrow 3^+} \frac{6 + x^2}{6 - 2x} \quad 10) \lim_{x \rightarrow 2} \frac{\sqrt{x + 7} - 3}{\sqrt{x + 2} - 2} \\
 &12) \lim_{x \rightarrow 2^-} \frac{x + x^2}{x^2 - 4} \quad 13) \lim_{x \rightarrow 2} \frac{\sqrt{x + 7} - 3}{\sqrt{x + 2} - 2} \quad 14) \lim_{x \rightarrow 2} \frac{\sqrt{3x + 3} - 3}{x^2 - 4} \quad 15) \lim_{x \rightarrow 0} \frac{\sqrt{1 - x} - 1}{x} \\
 &11) \lim_{x \rightarrow 2^+} \frac{\sqrt{x - 2}}{x - 2} \\
 &\blacksquare \lim_{x \rightarrow -\infty} \sqrt{\frac{2x^2 - x^3}{4x^2 + 3x}} \quad \blacksquare \lim_{x \rightarrow 1^+} \frac{x + 2}{x^2 - 3x + 2} \quad \blacksquare \lim_{x \rightarrow +\infty} \sqrt{\frac{x^3 + x^2}{4x^4 - 2x^2}} \\
 &\blacksquare \lim_{x \rightarrow -\infty} \sqrt{x^2 + 3x} + x \quad \blacksquare \lim_{x \rightarrow +\infty} \sqrt{x^2 + 4x} - 2x \quad \blacksquare \lim_{x \rightarrow -\infty} \frac{x^3 + x^2}{4x^3 - 2x^2} \quad \blacksquare \lim_{x \rightarrow 1} \frac{x - 1}{|x - 3| - 2} \\
 &\blacksquare \lim_{x \rightarrow +\infty} \frac{\sqrt{3x + 4} - 2}{x + 1} \quad \blacksquare \lim_{x \rightarrow +\infty} \sqrt{9x^2 + 4} - 3x \\
 &\blacksquare \lim_{x \rightarrow 0} \frac{x \sin(3x)}{1 - \cos x} \quad \blacksquare \lim_{x \rightarrow -\infty} \sqrt{2x^2 + 4x + 1} - 2x \\
 &\blacksquare \lim_{x \rightarrow 1} \frac{\sin(\pi x)}{x - 1} \quad \blacksquare \lim_{x \rightarrow 0} \frac{x \cos(2x)}{x - 2 \sin x} \\
 &\blacksquare \lim_{x \rightarrow \frac{\pi}{4}} \frac{\cos x - \sin x}{x - \frac{\pi}{4}} \quad \blacksquare \lim_{x \rightarrow 0} \frac{3 \tan x - \sin^2 x}{\sin(3x)} \\
 &\blacksquare \lim_{x \rightarrow +\infty} x \sin\left(\frac{1}{x}\right) \quad \blacksquare \lim_{x \rightarrow 0^+} \frac{1 - \cos \sqrt{x}}{x} \\
 &\blacksquare \lim_{x \rightarrow 0} \frac{1}{x^2} \left(\frac{2}{\cos x} - 3 + \cos x \right) \quad \blacksquare \lim_{x \rightarrow 3} \frac{\sin(x^2 - 3x)}{x - 3} \quad \blacksquare \lim_{x \rightarrow 0} \frac{\tan^2 x + x^3}{1 - \cos 2x} \quad \blacksquare \lim_{x \rightarrow \frac{\pi}{2}} \left(x - \frac{\pi}{2} \right) \tan(x) \\
 &\blacksquare \lim_{x \rightarrow -\infty} \sqrt{x^2 + x + 1} - \sqrt{x^2 + 1} \quad \blacksquare \lim_{x \rightarrow +\infty} \sqrt{x + \sqrt{x}} - \sqrt{x}
 \end{aligned}$$

EXERCICE 2 :

Calculer les limites suivantes en discutant suivant le paramètre réel m :

$$\begin{aligned}
 &1) \lim_{x \rightarrow +\infty} mx^3 + (m - 1)x^2 - 3x + 1 \quad 2) \lim_{x \rightarrow 2} \frac{x^2 - mx}{x - 2} \\
 &3) \lim_{x \rightarrow +\infty} \sqrt{9x^2 + x + 4} - mx
 \end{aligned}$$