

Exercice

Limites de fonctions composées

Déterminer les limites suivantes :

1. $\lim_{x \rightarrow -\infty} (x^3 - 7)^2$

2. $\lim_{x \rightarrow -\infty} \sqrt{3x^2 - x + 2}$

3. $\lim_{x \rightarrow +\infty} \sqrt{\frac{4x - 1}{x + 1}}$

4. $\lim_{x \rightarrow -\infty} \cos\left(\frac{1}{x}\right)$

Correction :

$$1. \lim_{x \rightarrow -\infty} x^3 - 7 = \lim_{x \rightarrow -\infty} x^3 = -\infty$$

$$\text{Or, } \lim_{X \rightarrow -\infty} X^2 = +\infty$$

$$\text{Donc, } \boxed{\lim_{x \rightarrow -\infty} (x^3 - 7)^2 = +\infty}$$

$$2. \lim_{x \rightarrow -\infty} 3x^2 - x + 2 = \lim_{x \rightarrow -\infty} 3x^2 = +\infty$$

$$\text{Or, } \lim_{X \rightarrow +\infty} \sqrt{X} = +\infty$$

$$\text{Donc, } \boxed{\lim_{x \rightarrow -\infty} \sqrt{3x^2 - x + 2} = +\infty}$$

$$3. \lim_{x \rightarrow +\infty} \frac{4x-1}{x+1} = \lim_{x \rightarrow +\infty} \frac{4x}{x} = 4$$

$$\text{Or, } \lim_{X \rightarrow 4} \sqrt{X} = 2$$

$$\text{Donc, } \boxed{\lim_{x \rightarrow +\infty} \sqrt{\frac{4x-1}{x+1}} = 2}$$

$$4. \lim_{x \rightarrow -\infty} \frac{1}{x} = 0$$

$$\text{Or, } \lim_{X \rightarrow 0} \cos X = 1$$

$$\text{Donc, } \boxed{\lim_{x \rightarrow -\infty} \cos\left(\frac{1}{x}\right) = 1}$$