

## Continuité et limites

### Exercice 1:

Calculer les limites suivantes.

1	$\lim_{x \rightarrow +\infty} \frac{-3x^3 + 7x^2 - 5}{1 + x + x^2} =$
3	$\lim_{\substack{x \rightarrow 3 \\ x > 3}} \frac{-5x}{3 - x} =$
5	$\lim_{\substack{x \rightarrow -1 \\ x > -1}} \frac{3x^2 - 5x}{x^2 + 4x + 3} =$
7	$\lim_{\substack{x \rightarrow 1 \\ x < 1}} \sqrt{\frac{1-x}{x+2}} =$
9	$\lim_{x \rightarrow +\infty} \frac{\sqrt{x^2 + 1}}{x + 4} =$
11	$\lim_{n \rightarrow +\infty} \sqrt{n} \cdot n =$
13	$\lim_{x \rightarrow -\infty} \frac{2x^2 - 3x + 1}{1 - 3x^2} =$
15	$\lim_{x \rightarrow +\infty} \sqrt{x^2 - x + 1} - x - 1 =$
17	$\lim_{x \rightarrow -\infty} \frac{\sqrt{x^2 + 1}}{x + 4} =$
19	$\lim_{x \rightarrow 8} \frac{\sqrt{2x} - 4}{\sqrt{x+1} - 3} =$
21	$\lim_{x \rightarrow +\infty} \cos \frac{1}{x} =$

2	$\lim_{x \rightarrow -\infty} \frac{-4x + 3}{3x^2 + 1} =$
4	$\lim_{\substack{x \rightarrow 3 \\ x > 3}} \frac{3x^2 - 5x}{x^2 + 4x + 3} =$
6	$\lim_{n \rightarrow +\infty} \frac{n}{(n+3)(n+5)} =$
8	$\lim_{x \rightarrow \infty} \sin \frac{1}{x} =$
10	$\lim_{x \rightarrow +\infty} \frac{2x - 1}{\sqrt{x}} =$
12	$\lim_{x \rightarrow +\infty} \sqrt{x^2 - x + 1} - 2x =$
14	$\lim_{\substack{x \rightarrow 2 \\ x < 2}} \sqrt{\frac{x-1}{x+2}} =$
16	$\lim_{n \rightarrow +\infty} \frac{n^2 + \frac{1}{n}}{2n^2 + 1} =$
18	$\lim_{x \rightarrow 3} \frac{\sqrt{x+6} - 3}{x-3} =$
20	$\lim_{x \rightarrow +\infty} \frac{\sqrt{x+5} - x}{\sqrt{x^2 - x}} =$
22	$\lim_{n \rightarrow +\infty} \frac{\sqrt{n}}{n^2 + 1} =$

**Exercice 2:**

Déterminer les limites suivantes (on donnera toutes les justifications utiles) :

$$1^\circ) \lim_{n \rightarrow +\infty} 5 \left( -\frac{1}{2} \right)^n$$

$$1^\circ) \lim_{x \rightarrow -\infty} \frac{3x^4 - x^2 + 3}{2 - x^2}$$

$$1^\circ) \lim_{x \rightarrow -1} \frac{(1+x)^3}{x^2 - 2}$$

$$2^\circ) \lim_{n \rightarrow +\infty} \frac{n - 2\sqrt{n}}{2 + 3n}$$

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

$$2^\circ) \lim_{\substack{x \rightarrow 2 \\ x > 2}} \frac{x^2 + 3}{2 - x}$$

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

$$3^\circ) \lim_{\substack{n \rightarrow 2 \\ x < 2}} \frac{x^2 - 5x + 6}{(2 - x)^2}$$

$$3^\circ) \lim_{\substack{x \rightarrow -3 \\ x > -3}} \frac{x^2 + x - 6}{-3x^2 - 7x + 6}$$

$$4^\circ) \lim_{x \rightarrow -\infty} \frac{2x^4 - x^2 + 1}{-3x^3 - x}$$

$$4^\circ) \lim_{x \rightarrow +\infty} 3x - \sqrt{2x^2 + 3}$$

$$4^\circ) \lim_{x \rightarrow +\infty} 2 \left( -\frac{1}{3} \right)^n$$

$$5^\circ) \lim_{x \rightarrow -2} \frac{(x+2)^3}{x^2 - 3}$$

$$5^\circ) \lim_{x \rightarrow -\infty} 3x - \sqrt{2x^2 + 3}$$

$$5^\circ) \lim_{x \rightarrow 3} \frac{2x - 6}{\sqrt{x+1} - 2}$$

$$6^\circ) \lim_{\substack{x \rightarrow 1 \\ x > 1}} \frac{x^2 + 3x + 1}{1 - x}$$

$$6^\circ) \lim_{x \rightarrow +\infty} \frac{x^3 + 1}{x^2 - 2x - 2}$$

$$6^\circ) \lim_{x \rightarrow +\infty} \frac{\sqrt{n} - 3n}{2n - 4}$$

$$7^\circ) \lim_{x \rightarrow 2} \frac{2x - 4}{\sqrt{x+7} - 3}$$

$$7^\circ) \lim_{x \rightarrow +2} \frac{\sqrt{3x+3} - 3}{2 - x}$$

$$7^\circ) \lim_{x \rightarrow -\infty} \sqrt{2x^2 - 3} + x$$

$$8^\circ) \lim_{\substack{x \rightarrow -2 \\ x > -2}} \frac{-2x^2 - x + 6}{x^2 - 2x - 8}$$

$$9^\circ) \lim_{x \rightarrow +\infty} 2x + \sqrt{-1 + 5x^3}$$