Exercices - Calcul de limites

- Calculer les limites suivantes:

1) $\lim\limits_{x\to 1} \dfrac{2x^2 - x - 10}{-x^2 + 4x - 3}$

2) $\lim\limits_{x\to -3} \dfrac{-3x^3 - 23x^2 - 37x + 15}{5x^2 + 14x - 3}$

3) $\lim\limits_{x\to \sqrt{2}} \dfrac{x^4 - 5x^2 + 6}{\sqrt{2}\, x^2 - 3x + \sqrt{2}}$

4) $\lim\limits_{x\to -4} \dfrac{-6x^2 + x + 1}{x^2 + 2x - 8}$

5) $\lim\limits_{x\to +\infty} \dfrac{-6x^2 + x + 1}{x^2 + 2x - 8}$

6) $\lim\limits_{x\to -\infty} \sqrt{\dfrac{3 - 5x}{x^2 - 5x + 3}}$

7) $\lim\limits_{x\to -\infty} \dfrac{\sqrt{3x^2 - 5x + 8}}{\sqrt{5x^2 - 4}}$

8) $\lim\limits_{x\to -\infty} \dfrac{x - 4}{\sqrt{2x^2 + 1}}$

9) $\lim\limits_{x\to 7} \dfrac{2\sqrt{x - 3} - \sqrt{2x + 2}}{5 - \sqrt{3x + 4}}$

10) $\lim\limits_{x\to 1} \dfrac{\sqrt[3]{3x - 2} - \sqrt[3]{x}}{1 - x^2}$

- Solutions

1) $\begin{cases} \lim\limits_{\substack{x\to 1\\ <}} \frac{2x^2-x-10}{-x^2+4x-3} = +\infty \\ \lim\limits_{\substack{x\to 1\\ >}} \frac{2x^2-x-10}{-x^2+4x-3} = -\infty \end{cases}$

2) $\lim\limits_{x\to -3} \dfrac{-3x^3-23x^2-37x+15}{5x^2+14x-3} = -\dfrac{5}{4}$

3) $\lim\limits_{x\to \sqrt{2}} \dfrac{x^4-5x^2+6}{\sqrt{2}\,x^2-3x+\sqrt{2}} = -2\sqrt{2}$

4) $\begin{cases} \lim\limits_{\substack{x\to -4\\ <}} \frac{-6x^2+x+1}{x^2+2x-8} = -\infty \\ \lim\limits_{\substack{x\to -4\\ >}} \frac{-6x^2+x+1}{x^2+2x-8} = +\infty \end{cases}$

5) $\lim\limits_{x\to +\infty} \dfrac{-6x^2+x+1}{x^2+2x-8} = -6$

6) $\lim\limits_{x\to -\infty} \sqrt{\dfrac{3-5x}{x^2-5x+3}} = 0$

7) $\lim\limits_{x\to -\infty} \dfrac{\sqrt{3x^2-5x+8}}{\sqrt{5x^2-4}} = \sqrt{\dfrac{3}{5}}$

8) $\lim\limits_{x\to -\infty} \dfrac{x-4}{\sqrt{2x^2+1}} = -\dfrac{1}{\sqrt{2}}$

9) $\lim\limits_{x\to 7} \dfrac{2\sqrt{x-3}-\sqrt{2x+2}}{5-\sqrt{3x+4}} = -\dfrac{5}{6}$

10) $\lim\limits_{x\to 1} \dfrac{\sqrt[3]{3x-2}-\sqrt[3]{x}}{1-x^2} = -\dfrac{1}{3}$