

Trouver, si elles existent, les limites suivantes :

$$1 \quad \lim_{x \rightarrow -1} \frac{2}{x+1}$$

$$2 \quad \lim_{x \rightarrow -2^-} \frac{4x+1}{x+2}$$

$$3 \quad \lim_{x \rightarrow 0} \frac{6x^2+8x+7}{x^4+x^2}$$

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

$$8 \quad \lim_{x \rightarrow 0^+} \frac{4x^3+5x^2-1}{x^7+2x^6+x^3}$$

$$9 \quad \lim_{x \rightarrow 6^+} \frac{x^2-6x}{2x^2-11x-6}$$

$$10 \quad \lim_{x \rightarrow 1} \frac{6x+7}{x^2-2x+1}$$

$$11 \quad \lim_{x \rightarrow 2} \frac{x^4-1}{5x-x^2-6}$$

$$12 \quad \lim_{x \rightarrow 3^-} \frac{4x+1}{x^3-3x^2-x+3}$$

$$13 \quad \lim_{x \rightarrow 5^+} \frac{\lfloor x \rfloor - 5}{x-5}$$

$$14 \quad \lim_{x \rightarrow 2} \left[8x+7 + \frac{x}{x-2} \right]$$

$$15 \quad \lim_{x \rightarrow 10} \ln \left(\frac{x-10}{7} \right)$$

$$16 \quad \lim_{x \rightarrow 5} \log_{10} \left(\frac{x-5}{x+5} \right)$$

$$17 \quad \lim_{x \rightarrow 3^-} \ln \left(\frac{3-x}{12} \right)$$

$$18 \quad \lim_{x \rightarrow 2^+} \log_{10} \left(\frac{x-2}{3x-1} \right)$$

$$19 \quad \lim_{x \rightarrow \infty} (3x^2+4x-7)$$

$$20 \quad \lim_{x \rightarrow -\infty} (x^4+3x-1)$$

$$4 \quad \lim_{x \rightarrow 3} \frac{x^2+x+3}{x-3}$$

$$5 \quad \lim_{x \rightarrow 7} \frac{3x+8}{x-7}$$

$$6 \quad \lim_{x \rightarrow 5^+} \frac{x^2+7x-13}{(x-5)(x+2)}$$

$$27 \quad \lim_{x \rightarrow \infty} \frac{2x^3+7x^2-x-13}{5x^4+x^3-2x}$$

$$28 \quad \lim_{x \rightarrow -\infty} \frac{x^5+x^3+x^2+6}{3x^5-x^2+x}$$

$$29 \quad \lim_{x \rightarrow -\infty} \frac{2x^3+8x^2+9}{x^2+x+1}$$

$$30 \quad \lim_{x \rightarrow -\infty} \frac{x^4+x^3+x-7}{2x^5+x-3}$$

$$31 \quad \lim_{x \rightarrow \infty} \frac{\sqrt{x^2+2}}{2x+3}$$

$$32 \quad \lim_{x \rightarrow \infty} \frac{5x}{\sqrt{2x^2+3}}$$

$$33 \quad \lim_{x \rightarrow \infty} \frac{\sqrt{x^3+1}}{x^2+1}$$

$$34 \quad \lim_{x \rightarrow -\infty} \frac{6x+7}{\sqrt{9x^2-x+5}}$$

$$35 \quad \lim_{x \rightarrow \infty} \frac{(2x-1)^8}{(x+3)^8}$$

$$36 \quad \lim_{x \rightarrow \infty} (x - \sqrt{x})$$

$$37 \quad \lim_{x \rightarrow \infty} 3^{-x}$$

$$38 \quad \lim_{x \rightarrow \infty} \frac{2^x - 2^{-x}}{2^x + 2^{-x}}$$

$$39 \quad \lim_{x \rightarrow \infty} (\sqrt{x^2+1} - x)$$

$$40 \quad \lim_{x \rightarrow \infty} \frac{x + \sqrt{x^2+5}}{3x+7}$$

$$21 \quad \lim_{x \rightarrow \infty} \sqrt{x^3 + 2x - 1}$$

$$22 \quad \lim_{x \rightarrow \infty} \frac{x+4}{x-4}$$

$$23 \quad \lim_{x \rightarrow -\infty} \frac{3x+6}{2x-1}$$

$$24 \quad \lim_{x \rightarrow \infty} \frac{x^3 + x^2 + 2x + 7}{x^3 + 3}$$

$$25 \quad \lim_{x \rightarrow \infty} \frac{3x^5 - x^4 + x^2 - 1}{x^5 - x^3 + 2}$$

$$26 \quad \lim_{x \rightarrow \infty} \frac{x^4 - 2x^3 + x^2 + 1}{2x^3 + x + 7}$$

$$41 \quad \lim_{x \rightarrow \infty} \left(\frac{2}{3}\right)^x$$

$$42 \quad \lim_{x \rightarrow \infty} (\sqrt{x+1} - \sqrt{x})$$

$$43 \quad \lim_{x \rightarrow 2^+} \left[\frac{3}{x-2} - \frac{2}{(x-2)^2} \right]$$

$$44 \quad \lim_{x \rightarrow 0^+} x \cot 2x$$

$$45 \quad \lim_{x \rightarrow 0^-} e^{1/x}$$

$$46 \quad \lim_{x \rightarrow \infty} e^{1/x}$$

Pour chacune des fonctions suivantes, trouver les asymptotes et esquisser le graphique de la fonction.

$$47 \quad f_1(x) = \frac{2x+5}{x-2}$$

$$48 \quad f_2(x) = \frac{2x}{x^2-4}$$

$$49 \quad f_3(x) = \frac{x^2+2}{x}$$

$$50 \quad f_4(x) = \frac{x-1}{2x-3}$$

$$51 \quad f_5(x) = \frac{1}{x^2-1}$$

$$52 \quad f_6(x) = \frac{3x^2-4x+2}{x-1}$$

$$53 \quad f_7(x) = \frac{x^2-5x+4}{x-5}$$

$$54 \quad f_8(x) = \frac{x^2+x-5}{x+3}$$

$$55 \quad f_9(x) = \frac{x^3-2x^2-2x-3}{x^2-2x-3}$$

$$56 \quad f_{10}(x) = \frac{3x^3+4x^2-5x-2}{2x^2+5x+2}$$

Réponse

1.

$$\lim_{x \rightarrow -1} \frac{2}{x+1} \quad (\text{forme } \frac{2}{0})$$

$$\lim_{x \rightarrow -1^-} \frac{2}{x+1} = \frac{2}{0^-} = -\infty \quad \text{et} \quad \lim_{x \rightarrow -1^+} \frac{2}{x+1} = \frac{2}{0^+} = +\infty$$

Donc,

$$\lim_{x \rightarrow -1} \frac{2}{x+1} \quad \text{\textcancel{d}} \quad \text{\textcancel{e}}$$

$$2. \quad \lim_{x \rightarrow -2} \frac{4x+1}{x+2} = \frac{-8+1}{-2+2} = \frac{-7}{0^-} = \infty$$

3. ∞

4. $\text{\textcancel{d}}$

5. $-\infty$

6. ∞

7. $\text{\textcancel{d}}$

8. ∞

9.

$$\begin{aligned} \lim_{x \rightarrow 6^+} \frac{x^2 - 6x}{2x^2 - 11x - 6} &= \lim_{x \rightarrow 6^+} \frac{x(x-6)}{(2x+1)(x-6)} \\ &= \lim_{x \rightarrow 6^+} \frac{x}{2x+1} = \frac{6}{13} \end{aligned}$$