

$$2.1 \quad \sqrt{x^2+x+1} = f(x) \quad \underline{\text{en } +\infty} : f(x) = \sqrt{x^2(1+\frac{1}{x}+\frac{1}{x^2})}$$

$$f(x) = x \left(1 + \frac{1}{x} + \frac{1}{x^2}\right)^{\frac{1}{2}} = x \left[1 + \frac{1}{2}\left(\frac{1}{x} + \frac{1}{x^2}\right) - \frac{1}{8}\left(\frac{1}{x} + \frac{1}{x^2}\right)^2\right]$$

$$= x \left[1 + \frac{1}{2}\frac{1}{x} + \frac{1}{2x^2} - \frac{1}{8x^2} + o\left(\frac{1}{x^2}\right)\right] = x \left[1 + \frac{1}{2x} + \frac{3}{8x^2} + o\left(\frac{1}{x^2}\right)\right]$$

$$f(x) \approx x + \frac{1}{2} + \frac{3}{8x} + o\left(\frac{1}{x}\right)$$

asymptote d'eq $y = x + \frac{1}{2}$, coërcive au dessus car $\frac{3}{8x} > 0$ qd $x \rightarrow +\infty$

$$\underline{\text{en } -\infty} : \sqrt{x^2} = -x, \text{ donc } f(x) = -x \left[1 + \frac{1}{2x} + \frac{3}{8x^2} + o\left(\frac{1}{x^2}\right)\right]$$

$$f(x) \approx -x - \frac{1}{2} - \frac{3}{8x} + o\left(\frac{1}{x}\right)$$

asymptote d'eq $y = -x - \frac{1}{2}$, coërcive au dessous car $-\frac{3}{8x} > 0$ qd $x < 0$

