

(97)

$$\lim_{x \rightarrow -\infty} \frac{x^3 + 7x - \log(x^2 + x - 4)}{2x + 3\sqrt{x^6 + x + 1} + \log(x^4 + 1)}$$

$$= \lim_{x \rightarrow -\infty} \frac{x^3 + 7x - 2 \log x^2 - \log\left(1 + \frac{1}{x} - \frac{4}{x^2}\right)}{2x + 3|x^3| \sqrt{1 + \frac{1}{x^5} + \frac{1}{x^6}} + 4 \log x + \log\left(1 + \frac{1}{x^4}\right)}$$

$$= \lim_{x \rightarrow -\infty} \frac{x^3 \left(1 + \frac{7}{x^3} - 2 \frac{\log x^2}{x^2} \cdot \frac{1}{x} - \frac{\log\left(1 + \frac{1}{x} - \frac{4}{x^2}\right)}{x^3}\right)}{|x^3| \left(3 \sqrt{1 + \frac{1}{x^5} + \frac{1}{x^6}} + \frac{2}{x^2} + 2 \frac{\log x^2}{x^2} \cdot \frac{1}{x} + \frac{1}{x^3} \log\left(1 + \frac{1}{x^4}\right)\right)}$$

$$= \lim_{x \rightarrow -\infty} \frac{x^3 \left(1 + \frac{7}{x^3} - 2 \frac{\log x^2}{x^2} \cdot \frac{1}{x} - \frac{\log\left(1 + \frac{1}{x} - \frac{4}{x^2}\right)}{x^3}\right)}{|x^3| \left(3 \sqrt{1 + \frac{1}{x^5} + \frac{1}{x^6}} + \frac{2}{x^2} + 2 \frac{\log x^2}{x^2} \cdot \frac{1}{x} + \frac{1}{x^3} \log\left(1 + \frac{1}{x^4}\right)\right)}$$

$$= -\frac{1}{3}$$