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

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

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

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

$$+ \lim_{x \rightarrow +\infty} \frac{3x^5 + 6x^4 + 3x^2 + 6x - 3x^5 - x^3 - x - 6x^4 - 2x^2 - 2}{x^3 + 2x^2 + 2x^2 + 4x} =$$

$$= -3 \cdot \log 3 \cdot \frac{1}{2} + 1$$