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$$\lim_{x \to +\infty} \sqrt{x^3+x+1} - x =$$

$$= \lim_{x \to +\infty} x \left(\frac{1}{x} \sqrt{x^3+x+1} - 1 \right) =$$

$$= \lim_{x \to +\infty} x \left(\sqrt{x + \frac{1}{x} + \frac{1}{x^2}} - 1 \right) =$$

$$= \infty \, (\infty) = \infty$$