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

$$\lim_{x \rightarrow +\infty} e^{\frac{1}{x} \log \frac{x^4 - 3x^3 + x^2 - 1}{x^2 - 2x \arctan x}}$$

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

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

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

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

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

$$= e^{0 \cdot 0 \cdot 0} = 1$$

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