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$$\lim_{x\to+\infty} \frac{\log(3^x + x^2 - 5x + 2\operatorname{arctg} x)}{\log(3^{5x} + x^4 + 2x^2 - 3)} =$$

$$= \lim_{x\to+\infty} \frac{\log 3^x + \log\left(1 + \frac{x^2}{3^x} - \frac{5x}{3^x} + \frac{2\operatorname{arctg} x}{3^x}\right)}{5\log 3^x + \log\left(1 + \frac{x^4}{3^{5x}} + \frac{2x^2}{3^{5x}} - \frac{3}{3^{5x}}\right)}$$

$$= \lim_{x\to+\infty} \frac{1}{5} \frac{1 + \frac{\log\left(1 + \frac{x^2}{3^x} - \frac{5x}{3^x} + \frac{2\operatorname{arctg} x}{3^x}\right)}{\log 3^x}}{1 + \frac{\log\left(1 + \frac{x^4}{3^{5x}} + \frac{2x^2}{3^{5x}} - \frac{3}{3^{5x}}\right)}{5\log 3^x}} =$$

$$= \frac{1}{5}$$