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

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

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

$$= \sqrt[3]{5} \lim_{x \rightarrow +\infty} x \left(5^{\frac{6x^2+7x+6x+7-6x^2+9x+2x+3}{18x^2+21x-6x-7}} - 1 \right) =$$

$$= \sqrt[3]{5} \lim_{x \rightarrow +\infty} x \left(5^{\frac{6x+10}{18x^2+15x-7}} - 1 \right) =$$

$$= \sqrt[3]{5} \lim_{x \rightarrow +\infty} x \frac{6x^2+10x}{18x^2+15x-7} = \left(5^{\frac{6x+10}{18x^2+15x-7}} - 1 \right) =$$

$$= \sqrt[3]{5} \cdot \frac{06}{18} \log 5 = \frac{\sqrt[3]{5}}{3} \log 5$$