

$$2.a \quad \lim_{x \rightarrow 1} \frac{x^{100} - 2x + 1}{x^{50} - 2x + 1} = \frac{1 - \frac{2}{x^{99}} + \frac{1}{x^{100}}}{\frac{1}{x^{50}} - \frac{2}{x^{99}} + \frac{1}{x^{100}}} = \frac{1 - \frac{2}{1} + \frac{1}{1}}{\frac{1}{1} - \frac{2}{1} + \frac{1}{1}} = \frac{0}{0}$$

Воспользуемся правилом Лопиталя:

$$\lim_{x \rightarrow 1} \frac{x^{100} - 2x + 1}{x^{50} - 2x + 1} = \frac{100x^{99} - 2}{50x^{49} - 2} = \frac{100 \cdot 1^{99} - 2}{50 \cdot 1^{49} - 2} = \frac{98}{48} = \frac{49}{24}$$