

$$f(x|\theta) = \theta x^{\theta-1}$$

$$b) L(\theta|x) = \prod_1^n \theta x_i^{\theta-1}$$

$$\begin{aligned} l(\theta|x) &= n \ln \theta + \sum_1^n \ln(x_i^{\theta-1}) \\ &= n \ln \theta + (\theta-1) \sum_1^n \ln(x_i) \end{aligned}$$

$$\frac{d}{d\theta} l(\theta|x) = \frac{n}{\theta} + \sum_1^n \ln(x_i)$$

$$0 = \frac{n}{\theta} + \sum_1^n \ln(x_i)$$

$$-\sum_1^n \ln(x_i) = \frac{n}{\theta} \quad -\theta \sum_1^n \ln(x_i) = n$$

$$c) \quad \boxed{\theta = \frac{-n}{\sum_1^n \ln(x_i)}}$$

$$\frac{d}{d\theta} \left(\frac{n}{\theta} + \sum_1^n \ln(x_i) \right) = \frac{-n}{\theta^2} < 0 \text{ max}$$

$$d) \quad \lim_{\theta \rightarrow 0} \theta x^{\theta-1} = 0 x^{(0)-1} = \boxed{0} \quad \begin{array}{l} \text{negative unendlich} \\ \text{bei } \theta, n > 0 \end{array}$$

$$\lim_{\theta \rightarrow \infty} \theta x^{\theta-1} = \infty(x)^{\infty-1} = \infty$$