Z3)

$$\frac{d \log(L(a,k))}{dk} = \frac{n}{k} + n \log a - \sum_{i=1}^{n} \log x_i = 0$$

$$\Updownarrow$$

$$\hat{k} = \frac{n}{\sum_{i=1}^{n} \log x_i - n \log a}$$

Druga pochodna:

$$\left(\frac{n}{k} + n \log a - \sum_{i=1}^{n} \log x_i\right)' = -\frac{n}{k^2}\Big|_{k=\hat{k}} = -\frac{\left(\sum \log \frac{x_i}{a}\right)^2}{n} < 0$$

czyli gdy $\sum \log \frac{x_i}{a} \neq 0$ to istnieje $\hat{k}$ i druga pochodna jest ujemna

czyli $MLE - k = \frac{n}{\sum_{i=1}^{n} \log \frac{x_i}{a}}$