Task a)

Formulate the negative log-likelihood function $-L(\lambda, k)$

$$-L(\lambda, k) = -log(p(v|\lambda, k))$$

$$p(v|\lambda, k) = \prod_{i=1}^{N} p(v_i|\lambda, k)$$

$$-L(\lambda, k) = -log\left(\sum_{i=1}^{N} \frac{k}{\lambda}\left(\frac{v_i}{\lambda}\right)^{(k-1)} e^{-(v_i/\lambda)^k}\right)$$

$$= -N \cdot log(k) + N \cdot k \cdot log(\lambda) - (k-1)\sum_{i=1}^{N} log(v_i) + \sum_{i=1}^{N}\left(\frac{v_i}{\lambda}\right)^k$$

Task b)

The minimisation problem can then be stated as follows, with constant terms left out.

$$arg\min_{\lambda,k} = -(k-1)\sum_{i=1}^{N} log(v_i) + \sum_{i=1}^{N}\left(\frac{v_i}{\lambda}\right)^k$$

This term can then be used inside MATLAB to compute the minimizer.