b) $$\lambda(x) = \frac{\sup\{L(\mu,\sigma^2;x) \mid (\mu,\sigma^2) \in \mathbb{R}\times\mathbb{R}^+\}}{\sup\{L(\mu,\sigma^2;x \mid (\mu,\sigma^2) \in \mathbb{R}\times(0,\sigma_0^2]\}} = \begin{cases} 1 & , \text{ if } \hat{\sigma}^2 \leq \sigma_0^2 \\ \left(\frac{\hat{\sigma}^2}{\sigma_0^2}\right)^{-\frac{n}{2}} \exp\left(\left(\frac{1}{\sigma_0^2} - \frac{1}{\hat{\sigma}^2}\right)\frac{n}{2}\hat{\sigma}^2\right) & , \text{ if } \hat{\sigma}^2 > \sigma_0^2 \end{cases}$$

c) $$\lambda(x) = \frac{\sup\{L(\mu,\sigma^2;x) \mid (\mu,\sigma^2) \in \mathbb{R}\times\mathbb{R}^+\}}{\sup\{L(\mu,\sigma^2;x \mid (\mu,\sigma^2) \in \mathbb{R}\times[\sigma_0,\infty)\}} = \begin{cases} 1 & , \text{ if } \hat{\sigma}^2 \geq \sigma_0^2 \\ \left(\frac{\hat{\sigma}^2}{\sigma_0^2}\right)^{-\frac{n}{2}} \exp\left(\underbrace{\left(\frac{1}{\sigma_0^2} - \frac{1}{\hat{\sigma}^2}\right)\frac{n}{2}\hat{\sigma}^2}_{=\left(\frac{\hat{\sigma}^2}{\sigma_0^2}-1\right)\frac{n}{2}}\right) & , \text{ if } \hat{\sigma}^2 < \sigma_0^2 \end{cases}$$