

BOLFARINE, p. 44, 2.1.ii

$X_1, \dots, X_m$  i.i.d.  $X \sim N(0, \sigma^2)$

$$L(x, \sigma^2) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x_1-0)^2}{2\sigma^2}} \dots \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x_m-0)^2}{2\sigma^2}}$$

$$L(x, \sigma^2) = \prod_{i=1}^m f(x_i | \sigma^2)$$

$$L(x, \sigma^2) = \left( \frac{1}{\sqrt{2\pi\sigma^2}} \right)^m e^{-\sum_{i=1}^m \left( \frac{(x_i-0)^2}{2\sigma^2} \right)}$$

$$L(x, \sigma^2) = \left( \frac{1}{\sqrt{2\pi}} \right)^m \left( \frac{1}{\sigma} \right)^m e^{-\left( \frac{(x_i-0)^2}{2\sigma^2} \right)^m}$$

BOLFARINE, p. 44, 2.3.i

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

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

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

$$f(x | \theta) = \frac{1}{x} \theta e^{(\log(\theta) x)}$$

BOLFARINE, p. 44, 2, 2, ii

$$X_1, X_2 \sim \text{Bin}(2, \theta)$$

$$L(2, \theta) = \prod_{i=1}^n f(x_i) = h(x_1, x_2) g_{\theta}(T(x_1, x_2))$$

$$L(2, \theta) = \binom{2}{x} \theta^x (1-\theta)^{2-x}$$

$$L(2, \theta) = \binom{2}{x}^2 \theta^{2x} (1-\theta)^{2-x}$$

BOLFARINE, p. 44, 2, 3, iii

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

$$L(\theta, x) = \prod_{i=1}^m \theta x_i^{\theta-1}$$

$$L(\theta, x) = m \theta x^{(\theta-1)m}$$

$$L(\theta, x) = m \theta x^{m\theta - m}$$

$$L(\theta, x) = m \theta \frac{x^{m\theta}}{x^m}$$

$$L(\theta; x) = \frac{1}{x^m} m \theta x^{m\theta}$$

BOLFARINE, p. 45, 2, 7, i

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

$$L(\theta; \mu) = h(\mu_1, \dots, \mu_m) g_\theta(T(\mu_1, \dots, \mu_m))$$

$$L(\theta; \mu) = \prod_{i=1}^m e^{-(\mu_i - \theta)}$$

$$L(\theta; \mu) = \prod_{i=1}^m \frac{1}{e^{(\mu_i - \theta)}}$$

$$L(\theta; \mu) = \prod_{i=1}^m \frac{1}{\frac{e^{\mu_i}}{e^\theta}}$$

$$L(\theta; \mu) = \frac{1}{\frac{e^{m\mu}}{e^{m\theta}}}$$

$$L(\theta; \mu) = 1 \cdot \frac{e^{m\mu}}{e^{m\theta}}$$

$$L(\theta; \mu) = e^{m\mu} \frac{1}{e^{m\theta}}$$