

$$\log(\mathcal{L}(\beta)) = \sum_i^n \log\left(\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(y_i - x_i\beta)^2}{2\sigma^2}}\right) = \sum_i^n \log\left(\frac{1}{\sigma\sqrt{2\pi}}\right) - \frac{(y_i - x_i\beta)^2}{2\sigma^2}$$