

$$L(\lambda | y) = \prod_{i=1}^n f(y_i | \lambda)$$

$$= \prod_{i=1}^n \frac{e^{-\lambda} \lambda^{y_i}}{y_i!}$$

$$= \left[\frac{e^{-\lambda} \lambda^{y_1}}{y_1!} \right] \left[\frac{e^{-\lambda} \lambda^{y_2}}{y_2!} \right] \dots \left[\frac{e^{-\lambda} \lambda^{y_n}}{y_n!} \right]$$

$$= \frac{e^{-n\lambda} \lambda^{[y_1 + y_2 + \dots + y_n]}}{(y_1!)(y_2!) \dots (y_n!)}$$

$$= \frac{e^{-n\lambda} \lambda^{\sum y_i}}{\prod_{i=1}^n y_i!}$$