and that is coming from this party above now **why can we get rid of that...** we can get rid of it because again if you have a function.

Maximum Likelihood Estimation - III

- Deriving further:

$$\log L(\theta) = \sum_{n=1}^{N} \log\left(\frac{1}{\sqrt{2\pi\hat{\sigma}}} e^{-\frac{(y_n-\hat{y}_n)^2}{2\hat{\sigma}^2}}\right)$$

$$= \sum_{n=1}^{N} \cancel{\log\left(\frac{1}{\sqrt{2\pi\hat{\sigma}}}\right)} + \boxed{\log\left(e^{-\frac{(y_n-\hat{y}_n)^2}{2\hat{\sigma}^2}}\right)}$$

$\log a \cdot b = \log a + \log b$

$\underset{\theta}{\operatorname{argmax}} f(\theta)$

M

- Omitting the constant term above with respect to the parameters θ:

$\log_e e^x = x$

$$\underset{\theta}{\operatorname{argmax}} \log L(\theta) \approx \underset{\theta}{\operatorname{argmax}} \cancel{\frac{1}{2\hat{\sigma}^2}} \sum_{n=1}^{N} - \left(y_n - \overbrace{\left(\theta_0 + \sum_{m=1}^{M} \theta_m x_m\right)}^{\hat{y}_n}\right)^2$$