

$$\begin{aligned}\mathbb{E} \left[ (f(x) - \mathbb{E}[f(x)])^2 \right] &= \mathbb{E} \left[ f(x)^2 - 2f(x) \mathbb{E}[f(x)] + \mathbb{E}[f(x)]^2 \right] \\ &= \mathbb{E}[f(x)^2] - 2 \mathbb{E}[f(x)]^2 + \mathbb{E}[f(x)]^2 \\ &= \mathbb{E}[f(x)^2] - \mathbb{E}[f(x)]^2\end{aligned}$$

