

Variance of 2θ

$$\text{Var}(2\theta) = 4 \text{Var}(\tilde{\theta})$$

information: $I(\theta) = 4n$.

Theorem:

$n \rightarrow \infty$ $\hat{\theta}_n \sim \text{Normal}$

mean = θ

$$I(\theta) \cdot \text{Var}(\hat{\theta}_n) \rightarrow 1$$

$$\Rightarrow \text{Var}(\hat{\theta}_n) = 1 / I(\theta)$$

$$\text{Var}(\hat{\theta}_n) = 1 / 4n$$

$$\text{Var}(2\theta) = 4 \text{Var}(\tilde{\theta})$$

$$= 4 \cdot 1 / 4n$$

$$= 1/n$$