

$$[1](a) \mu=90 \quad \sigma=8.0$$

$$n=25 \rightarrow \bar{X}=93.0 \quad \sigma=8.0$$

$$(b) \mu=90 \quad \sigma=8.0$$

$$n=25 \rightarrow \bar{X}=93.0 \quad \sigma=? \quad s=9.0$$

$$[2](a) \quad n=100 \quad \text{是(反對)} \rightarrow X \quad \hat{p}=X/n$$

$$E(\hat{p}) = E\left(\frac{X}{n}\right) = \frac{1}{n} E(X) = \frac{1}{n} n \cdot p = p$$

$$(b) \quad \text{Var}(\hat{p}) = \text{Var}\left(\frac{X}{n}\right) = \frac{1}{n^2} \text{Var}(X) = \frac{1}{n^2} \cdot n \cdot p \cdot (1-p) = \frac{1}{n} \cdot p \cdot q \quad \sqrt{\text{Var}(\hat{p})} = \sqrt{\frac{p \cdot q}{n}}$$

$$(c) \quad X=60 \quad n-X=40 \quad \alpha=0.05$$

$$\hat{p}=0.6 \quad 0.6 \times (0.5-0.025) = 0.6 \times 0.475 = 0.285$$

$$0.6-0.285 < p < 0.6+0.285 \Rightarrow 0.315 < p < 0.885 \#$$

$$(d) \quad \alpha=0.1$$

$$0.6 \times (0.5-0.1) = 0.6 \times 0.4 = 0.24$$

$$0.6-0.24 < p < 0.6+0.24 \Rightarrow 0.36 < p < 0.84 \#$$

$$[3] \quad H_0: p=60\% \quad \text{抽100人} \Rightarrow \text{是(反對)}: 66 \quad \text{不是(反對)}: 34$$

$$(a) \quad P(X=66) = P(X=66 | p=0.6)$$

$$(b) \quad P(X \geq 66)$$