

(1)

$$a) H_0: \mu = 70$$

$$Z = \frac{73-70}{8/\sqrt{25}} = 1.875$$

双尾检验  $\alpha = 0.05$  临界值  $\pm 1.96$

$$\because |Z| = 1.875 < Z_{\alpha/2} = 1.96$$

$\therefore H_0$  假设不会被推翻

$$b) H_0: \mu = 70$$

$$t = \frac{73-70}{9/\sqrt{25}} = 1.67 \quad \text{自由度 } 25-1=24 \text{ 的 } t \text{ 分布}$$

$$t_{0.05} \text{ 在 } n-1=24 = 1.7109$$

$$1.7109 > 1.67$$

无法推翻

$$(2) a) E(\hat{p}) = p \quad p \text{ 为 } \mu$$

$$E\left(\frac{X}{n}\right) = E\left(\frac{1}{n} \sum_{i=1}^n X_i\right) = \frac{1}{n} \sum_{i=1}^n E(X_i) = \frac{1}{n} \cdot p \cdot n = p = p$$

$$b) \text{Var}(\hat{p}) = \text{Var}\left(\frac{X}{n}\right) = \frac{1}{100} p \cdot q$$

$$\text{std}(\hat{p}) = \frac{1}{10} \sqrt{pq}$$

$$c) (0.504, 0.696) = \bar{x} \pm 1.96 \cdot \frac{s}{10}$$

$$d) (0.519, 0.681) = \bar{x} \pm 1.645 \cdot \frac{s}{10}$$

(3) 在选修

(a)  $H_0: p = 0.6$

$$Z = \frac{0.6 - 0.66}{\sqrt{0.6 \cdot 0.4} / 10} = -1.225$$

(b)

(c)

(d) 拒絕接受  $H_0$