

$$1. (a) P(\bar{X} > 73 | \mu = 70) = \text{st. norm. sf}(73, \text{loc} = 70, \text{scale} = 8/\sqrt{25}) = 0.03$$

$$\therefore 0.03 < \alpha = 0.05$$

$\therefore$  可推翻

$$(b) P(\bar{X} > 73 | \mu = 70) = \text{st. t. sf}(73, \text{loc} = 70, \text{scale} = 9/\sqrt{25}, \text{df} = 24) = 0.054$$

$$\therefore 0.054 > \alpha = 0.05$$

$\therefore$  不可推翻

$$2. (a) E(\hat{p}) = E\left(\frac{X}{n}\right) = \frac{1}{n} E(X) = \frac{1}{n} \cdot np = p$$

$$(b) \text{Var}(\hat{p}) = \text{Var}\left(\frac{X}{n}\right) = \frac{1}{n^2} \text{Var}(X) = \frac{1}{n^2} \cdot npq = \frac{pq}{n}$$

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

$$(c) \text{st. t. interval}(0.95, \text{df} = 99, \text{loc} = 60, \text{scale} = \sqrt{24}/\sqrt{100})$$

$$= (59.028, 60.972)$$

$$(d) \text{st. t. interval}(0.9, \text{df} = 99, \text{loc} = 60, \text{scale} = \sqrt{24}/\sqrt{100})$$

$$= (59.187, 60.813)$$

$$3. (a) P(X = 66) = \text{st. binom. pmf}(k = 66, n = 100, p = 0.6) = 0.039$$

(b)

(c)

(d) 不拒絕接受

(e)

(f)

(g)

(h)