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

$\therefore 0.03 < \alpha = 0.05$

可推翻

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

$\therefore 0.054 > \alpha = 0.05$

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

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

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

$(59.028, 60.972)$

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

$= (59.187, 60.813)$

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

(d) 不拒絕接受