1. (a) $8/\sqrt{25} = \frac{8}{5} = 1.6$ $1.6 \times 1.96 = 3.136$

∵ 3.136 > 3 (誤差3歲) ∴ 不能推翻, 容許誤差 3.136歲

(b) $\mu = 70$ $\sigma^2 = 9$ $n = 25$ $\bar{x} = 73$

$$z = \frac{73-70}{\frac{9}{\sqrt{25}}} = 1.667$$

$P(z < 1.667) = 0.6478 < \alpha = 0.05 \Rightarrow$ 幾乎不會發生

So. 假設不成立

2. (a) $E(P) = E(\frac{X}{n}) = \frac{1}{n}E(x) = \frac{1}{n} \cdot n \cdot p = p$

(b) $Var(P) = Var(\frac{X}{n}) = \frac{1}{n^2}Var(x) = \frac{1}{n^2} \cdot n \cdot p \cdot q \Rightarrow \sigma = \sqrt{\frac{1}{n}p(1-p)}$

(c) $\sigma = \frac{\sqrt{24}}{100} = \frac{2\sqrt{6}}{100}$ $1.96 \times \frac{2\sqrt{6}}{100} \fallingdotseq 0.096$

95% 信心區間 0.6 ± 0.096 ([0.504, 0.696])

(d) $1.645 \times \frac{2\sqrt{6}}{100} = 0.0806$

90% 信心區間 0.6 ± 0.0806

3. (a) 77.9% 距 1.224σ $\sigma = 0.049$ $\sigma = \sqrt{\frac{1}{100}0.6 \times 0.4} \fallingdotseq 0.0490$

$0.049x = 0.06$

$x = 1.224$

(b) $\frac{(100-77.9)}{100} \times \frac{1}{2} = \frac{11.05}{100} = 11.05\%$

(c) $1.96 \times 0.049 = 0.09604$

$0.6 + 0.09604 \fallingdotseq 0.696 \Rightarrow$ 約70人

(d) 接受

B0729038 羅元澧