1. (1) $t_{0.025}(10) = 2.228$

(2) $t_{0.95}(8) = -1.86$
$\quad\quad$ " $1-0.05$

(3) $\chi^2_{0.25}(12) = 21.026$

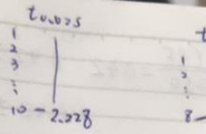
(4) $\chi^2_{\alpha}(15) = 7.26 \quad \alpha = ?$
$\quad\quad \alpha = 0.95$

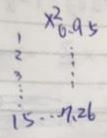
(5) $\chi^2_{0.95}(12) = 3.940$

(6) $F_{0.05}(5.8) = 3.69$

(7) $F_{0.95}(6.7) = \dfrac{1}{F_{0.05}(7.6)} = \dfrac{1}{4.12} = 0.238$

(8) $F_{\alpha}(6.6) = 4.28$
$\quad\quad \alpha = 0.05$





7. (1) $\hat{p} = \dfrac{45}{80} = 0.56$

(2) $Z\dfrac{\alpha}{2}\sqrt{\dfrac{\hat{p}(1-\hat{p})}{n}} = Z_{0.025}\sqrt{\dfrac{0.56\times0.44}{80}} = 1.96\times0.06 = 0.12$

(3) $\hat{p} \pm Z\dfrac{\alpha}{2}\sqrt{\dfrac{\hat{p}(1-\hat{p})}{n}} = 0.56 Z_{0.05}\sqrt{\dfrac{0.56\times0.44}{80}} = 0.56 \pm 1.645 \times 0.06$
$= 0.56 \pm 0.1 \Rightarrow (0.46, 0.66)$

8.
$\hat{p}_1 = 0.55 \quad \hat{p}_2 = 0.6$

$(\hat{p}_1 - \hat{p}_2) \pm Z\dfrac{\alpha}{2}\sqrt{\dfrac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \dfrac{\hat{p}_2(1-\hat{p}_2)}{n_2}} = (0.55-0.6) \pm Z_{0.025}\sqrt{\dfrac{0.55\times0.45}{100} + \dfrac{0.6\times0.4}{100}}$
$= -0.05 \pm 1.96 \times 0.07$
$= -0.05 \pm 0.14$
-0.19
$(-0.19, 0.09)$

2. (1) $\hat{p} = \frac{105}{250} = 0.42$ $0.42 \pm z_{0.05}\sqrt{\frac{0.42 \times 0.58}{250}}$

$= 0.42 \pm 1.645 \times 0.03$

$= 0.42 \pm 0.05 \Rightarrow (0.37, 0.47)$

(2) (a) $\hat{p} = 0.3 \cdot e = 0.03 \quad 1-\alpha = 0.95$

$e = \frac{\sigma}{\sqrt{n}} \times z \quad n = (\frac{z}{e})^2 \times \hat{p} \times (1-\hat{p})$

$n = (\frac{1.96}{0.3})^2 \times 0.3 \times 0.7 = 896.37 \fallingdotseq 897$

(b) $\hat{p} = 0.42 \quad n = (\frac{1.96}{0.03})^2 \times 0.42 \times 0.58 = 1039.79$

$\fallingdotseq 1040$

(c) $\hat{p} = 0.5 \quad n = (\frac{1.96}{0.03})^2 \times 0.5 \times 0.5 = 1067.1 \fallingdotseq 1068$

2. $e = \frac{\sigma}{\sqrt{n}} \times z_{\frac{\alpha}{2}}$

(1) $\sigma = 3 \quad e = 0.5 \quad \alpha = 1-0.95$

$n = (\frac{3}{0.5})^2 \times 1.96^2 = 138.3$

$\fallingdotseq 139$

(2) $\sigma = 0.2 \quad e = 0.03 \quad 1-\alpha = 0.9$

$n = (\frac{0.2}{0.03})^2 \times 1.645^2 = 120.27 \fallingdotseq 121$

(3) $\sigma = 0.05 \quad e = 0.02 \quad 1-\alpha = 0.98$

$n = (\frac{0.05}{0.02})^2 \times 2.326^2 = 33.8 \fallingdotseq 34$