3. $n=10$ $\quad \bar{x}=13.63 \quad s=6.05 \quad n-1=9 \quad 1-\alpha=0.98 \quad \frac{\alpha}{2}=0.01$

$\bar{x} \pm t_{\frac{\alpha}{2}}(n-1) \frac{s}{\sqrt{n}} = 13.63 \pm t_{0.01}(9) \frac{6.05}{\sqrt{10}}$

$= 13.63 \pm 2.821 \times 1.91 = 13.63 \pm 5.39 \quad (8.24, 19.02)$ �

4.

(1) $n=1200$, $\hat{p}=0.33 \quad 1-\alpha=0.98$

$0.33 \pm Z_{\frac{\alpha}{2}} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

$= 0.33 \pm 2.327 \times \sqrt{\frac{0.33 \times 0.67}{1200}}$

$= 0.33 \pm 0.3 = (0.30, 0.36)$

(2) $n=820 \quad x=650 \quad \hat{p}=\frac{650}{820}=0.79$

$1-\alpha=0.95 \quad \frac{\alpha}{2}=0.025$

$0.79 \pm 1.96 \times \sqrt{\frac{0.79 \times 0.21}{820}}$

$= 0.79 \pm 1.96 \times 0.014$

$= 0.79 \pm 0.03 = (0.76, 0.82)$

14. (1)

$n=15$, $\bar{x}=1.73 \quad s=0.8 \quad 1-\alpha=0.95 \quad t_{\frac{\alpha}{2}}(n-1) = t_{0.025}(14) = 2.145$

$1.73 \pm t_{0.025}(14) \frac{0.8}{\sqrt{15}} = 1.73 \pm 2.145 \times \frac{0.8}{\sqrt{15}}$

$= 1.73 \pm 0.44 = (1.27, 2.17)$

$1.73 \pm t_{0.10}(14) \frac{0.8}{\sqrt{15}} = 1.73 \pm 1.345 \frac{0.8}{\sqrt{15}} = 1.73 \pm 0.28 = (1.45, 2.01)$