

7.1-7.4

4 a) $\alpha = .95$ $z_{\alpha/2} = 1.96$ C.I. = $13.1 \pm 1.96 \frac{\sqrt{3.42}}{\sqrt{36}} = \{12.496, 13.704\}$.30%

b) $2.73 \pm 1.96 \frac{\sqrt{1.047}}{\sqrt{64}} = \{2.651, 2.809\}$.15%

c) $28.6 \pm 1.96 \frac{\sqrt{1.09}}{\sqrt{41}} = \{28.28, 28.92\}$.10%

6 a) $\alpha = .01$ $z_{\alpha/2} = 2.58$.495 = $34 \pm 2.58 \frac{\sqrt{12}}{\sqrt{38}} = \{32.55, 35.45\}$

b) $\alpha = .1$ $z_{\alpha/2}$ = find .45 on table = 1.645 = $1049 \pm 1.645 \frac{\sqrt{51}}{\sqrt{65}} = \{1047.543, 1050.457\}$

c) $\alpha = .05$ $z_{\alpha/2}$ = find .475 on table = 1.96 = $66.3 \pm 1.96 \frac{\sqrt{2.48}}{\sqrt{24}} = \{65.973, 66.627\}$

7 a) $\alpha = .05$ so $z_{\alpha/2} = 1.96$ width of C.I. = $2 \left[1.96 \frac{10}{\sqrt{100}} \right] = 3.92$

b) $2 \left[1.96 \frac{10}{\sqrt{200}} \right] = 2.772$

c) $2 \left[1.96 \frac{10}{\sqrt{400}} \right] = 1.96$

8 a) when you double n your C.I. width decreases by $1/\sqrt{2}$

b) when you quadruple n C.I. width decreased by $1/\sqrt{4}$ or $1/2$

9 a) $\alpha = .1$ $z_{\alpha/2}$ = check chart for area under .45 = 1.645 so width = $2 \left[1.645 \left(\frac{10}{\sqrt{100}} \right) \right] = 3.29$

b) $\alpha = .01$ $\alpha/2 = .005$ $z_{\alpha/2}$ = check chart under .495 = 2.58 so width = $2 \left[2.58 \left(\frac{10}{\sqrt{100}} \right) \right] = 5.16$

c) increasing the confidence coefficient increases width of C.I.

12 a) $n = 400$ $s = 1000$ $\alpha = .05$ $\hat{p} = 32600$

$z_{\alpha/2} = 1.96$

C.I. = $32600 \pm 1.96 \frac{1000}{\sqrt{400}} = \{32,404 < p < 32,796\}$

12 b) $\hat{\mu} = \bar{x} = 24,100$ margin of error: $1.96 \frac{800}{\sqrt{100}} = 156.8$

c) $\alpha = .02$ $\alpha/2 = .01$ $z_{\alpha/2} = 1.96$ $1.96 \cdot 800 = 1568$ C.I. = $22,909 \pm 2.33 \frac{800}{\sqrt{100}} =$
 $\{22,722.6, 23,095.4\}$

13 $n=32$ $\bar{x}=11.7\%$ $s=2.1\%$ $\alpha=.1$ $\alpha/2=.05$ $z_{\alpha/2}=1.645$

C.I. = $11.7 \pm 1.645 \frac{2.1}{\sqrt{32}} = \{11.084, 12.311\}$

15 $n=36$ $\bar{x}=5474$ $s=764$ $\alpha=.1$ $z_{\alpha} = 1.28$ $1.28 = 1.28$

UCL = $5474 + 1.28 \frac{764}{\sqrt{36}} = 5636.98$ so 90% confident that $\bar{y} < 5636.98$