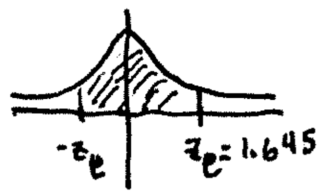
§6.1 #29

$$\begin{bmatrix} c = 0.90 \\ \sigma = 6.8 \\ E = 1 \end{bmatrix} \longrightarrow \boxed{n = \left(\frac{z_c \sigma}{E}\right)^2}$$

From $c = 0.90$, we get $z_c = 1.645$



Therefore

$$n = \left(\frac{(1.645)(6.8)}{1}\right)^2 = 125.126$$

So, we need [redacted] sample size of $n = 126$ to estimate μ.

§6.1 #37

$$\begin{bmatrix} n = 50 \\ \bar{x} = 2650 \\ \sigma = 425 \\ c = 0.95 \end{bmatrix} \quad c = 0.95 \longrightarrow z_c = 1.96$$

$$\boxed{E = z_c \sigma_{\bar{x}}}$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{425}{\sqrt{50}} = 60.1040$$

Thus,

$$E = (1.96)(60.1040) = 117.80384$$

So our confidence interval is

$$\bar{x} - E < \mu < \bar{x} + E$$

$$\downarrow$$

$$2650 - 117.80384 < \mu < 2650 + 117.80384$$

$$\downarrow$$

$$2532.196 < \mu < 2767.80384$$

§6.2 #20

$$\left[\begin{array}{l} n=7 \\ \bar{x}=110 \\ s=44.50 \\ c=0.95 \end{array}\right] \quad n=7 \rightarrow d.f.=6, \quad c=0.95 \rightarrow t_c = 2.447$$

$$E = t_c \frac{s}{\sqrt{n}} = (2.447)\frac{(44.50)}{\sqrt{7}} = 41.157$$

interval:

$$\bar{x}-E < \mu < \bar{x}+E$$

$$\downarrow$$

$$110-41.157 < \mu < 110+41.157$$

$$\downarrow$$

$$68.843 < \mu < 151.157$$

§6.3 #13

$$\left[\begin{array}{l} n=3110 \\ c=0.99 \\ \hat{p} = \frac{1435}{3110} = 0.4614 \end{array}\right] \quad c=0.99 \rightarrow z_c = 2.756, \quad \hat{p} \rightarrow \hat{q} = 1-\hat{p} = 0.5386$$

$$E = z_c\sqrt{\frac{\hat{p}\hat{q}}{n}} = (2.756)\sqrt{\frac{(0.4614)(0.5386)}{3110}}$$

$$= 0.0246$$

confidence interval:

$$\hat{p}-E < p < \hat{p}+E$$

$$0.4614 - 0.0246 < p < 0.4614 + 0.0246$$

$$\downarrow$$

$$0.4368 < p < 0.486$$