Section 6-3

#12 $n = 420$, $x = 279 \rightarrow \hat{p} = \frac{x}{n} = 0.664 \rightarrow \hat{q} = 1 - \hat{p} = 0.336$

$c = 0.9$

$z_c = 1.645$

$E = z_c \sqrt{\frac{\hat{p}\hat{q}}{n}}$

$= 0.0379$

$\bar{p} - E = 0.6261$

$\bar{p} + E = 0.7019$

Confidence interval

$0.6261 < p < 0.7019$

$c = 0.95$

$z_c = 1.96$

$E = z_c \sqrt{\frac{\hat{p}\hat{q}}{n}}$

$= 0.0451$

$\bar{p} - E = 0.6189$

$\bar{p} + E = 0.7091$

Confidence interval

$0.6189 < p < 0.7091$

#13 $c = 0.99$, $n = 3110$, $x = 1435$

$\rightarrow \hat{p} = \frac{x}{n} = 0.4614$

$z_c = 2.575$ $\rightarrow \hat{q} = 1 - \hat{p} = 0.5386$

$E = z_c \sqrt{\frac{\hat{p}\hat{q}}{n}}$

$= 0.023$

$\hat{p} - E = 0.4384$

$\hat{p} + E = 0.4844$

Confidence interval

$0.4384 < p < 0.4844$

#18 $C = 0.99$, $E = 0.2$

$\downarrow$

$z_c = 2.575$

a) $\hat{p} = \hat{q} = 0.5$

$$\Rightarrow n = \hat{p}\hat{q}\left(\frac{z_c}{E}\right)^2 = 41.44 \xrightarrow{\text{round up}} 42$$

b) $\hat{p} = 0.87$, $\hat{q} = 1 - \hat{p} = 0.13$

$$\Rightarrow n = \hat{p}\hat{q}\left(\frac{z_c}{E}\right)^2 = 18.748$$