• 8.40:
  - a: 90% confidence interval: $-2.2 \pm 1.645 \times \sqrt{\frac{83}{64} + \frac{1.67}{64}} = -2.2 \pm .32$.... “90% confident” means (informally) that the probability that the true difference between the means lies in the constructed interval is .9; formally it means that a process is being used to construct the interval that 90% of the time it is performed will lead to an interval which contains the true difference.
  - b: 99% confidence interval: $-2.2 \pm 2.58 \times \sqrt{\frac{83}{64} + \frac{1.67}{64}} = -2.2 \pm .50$.... Since 0 is not in this confidence interval, and we would expect it to be if the two means were the same, then we can be reasonably (99%, at least) confident that the two means are different.

• 8.42: 90% confidence interval: $-.7 \pm 1.645 \times \sqrt{\frac{1.44}{100} + \frac{2.64}{100}} = -.7 \pm .332$.... Since 0 is not in this confidence interval, and we would expect it to be if the two means were the same, then we can be reasonably (90%, at least) confident that the two means are different; and more over that region 2 has a greater number of calls on average.

• 8.48:
  - a: 99% confidence interval: $-8 \pm 2.58 \times \sqrt{\frac{42}{30} + \frac{102}{40}} = -8 \pm 4.49$....
  - b: Since 0 is not in this confidence interval, and we would expect it to be if the two means were the same, then we can be reasonably (99%, at least) confident that the two means are different; and more over that the experimental group has a greater mean.

• 8.50:
  - a: $\frac{120}{500} - \frac{147}{500} = -.054$.
  - b: $SE \approx \sqrt{\frac{24+.76}{500} + frac{.294 \times .7065}{100} = .0279}$....
  - c: 95% margin of error: $\pm 1.96 \times .0279... = \pm .0547$....

• 8.54: Estimate for difference of proportion ($D - R$): $.44 - .41 = .03$. 95% confidence margin of error: $\pm 1.96 \times \sqrt{\frac{.44+.56}{1094} + frac{.41 \times .59995}{1094} = \pm .0424}$. Since 0 is within the margin of error of the observed difference, we can’t really conclude anything about whether
there is a difference between proportion of Republicans and Democrats who consider the
economy an important issue.

- **8.59:** \( \hat{p}_G = 126/180 = .7; \hat{p}_{NG} = 54/100 = .54 \). 90% confidence interval for the
difference: 
  \[ .16 \pm 1.645 * \sqrt{\frac{.7 * .3}{180} + \frac{.54 * .46}{100}} = .16 \pm .099 \ldots \]
  Since the interval contains only positive values, we can be (at least) 90% confident that the proportion of first-borns among
  college grads is higher than the proportion among non college grads.

- **8.62:**
  - a: \( \hat{p}_{>1000} = \frac{23}{41} = .56 \ldots \); 95% confidence margin of error is
  \( \pm 1.96 \sqrt{\frac{.56 * .44}{41}} = \pm .1519 \ldots \)
  - b: \( \hat{p}_{>1000} - \hat{p}_{<1000} = .24 \ldots \); 95% confidence margin of error is
  \( \pm 1.96 \sqrt{\frac{.56 * .44}{41} + \frac{.41 * .59}{32}} = \pm .221 \ldots \)

- **8.65:**
  - a: \( \leq \bar{x} + 1.28 * \frac{s}{\sqrt{n}} = 76.63 \ldots \)
  - b: \( \leq 1.8944 \).

- **8.66:** \( \geq \hat{p} - 2.33 * \sqrt{\frac{p(1-p)}{n}} = .4317 \ldots \)

- **8.68:** Want \( 1.96 * \frac{12.7}{\sqrt{n}} \leq 1.6 \) or \( n \geq 243 \) (n must be a whole number).

- **8.70:** Want \( 1.645 \sqrt{\frac{27.8}{n} + \frac{27.8}{n}} \leq .17 \) or \( n \geq 5207 \).

- **8.75:** Range is 104, so use 104/4 = 26 as estimate for \( \sigma \). Want \( 2.58 \sqrt{\frac{26^2}{n} + \frac{26^2}{n}} \leq 5 \) or
  \( n \geq 360 \).

- **8.80:** Want \( 1.96 \sqrt{\frac{6^2}{n} + \frac{6^2}{n}} \leq .2 \) or \( n \geq 70 \).