

Homework Solutions

Chapter 9 – Page 595

Exercise 24

- (a) (i) The sample certainly appears to be random, because they used randomness. A more specific question is, is it a *simple* random sample. Probably not. The methodology excluded people without phones and, even though phone *numbers* were equally likely, the people who owned those phones were not equally likely because some of them were not at home, others chose not to answer the phone, etc.
- (ii) The population of people in Ann Arbor who own phones.
- (iii) It is reasonable to believe that people who do not own phones are also more likely not to own a car, and therefore will be more likely to use public transportation. Yes, this could bias the results.
- (b) 81%, the same as the sample proportion.
- (c) The 95% confidence interval is

$$\begin{aligned}\hat{p} \pm z \sqrt{\frac{\hat{p}(1 - \hat{p})}{n}} &= 0.81 \pm 1.960 \sqrt{\frac{(0.81)(0.19)}{822}} \\ &= 0.63 \pm 0.02682.\end{aligned}$$

- (d) The margin of error is 0.02682. There are two ways to reduce it. One is to decrease the confidence level, but that is not desirable. The other is to increase the sample size.