1. A cellphone provider would like to estimate the proportion of subscribers who would upgrade to a new cellphone with improved features if it were made available at a substantially reduced cost. In a random sample of 500 subscribers, 135 subscribers responded that they would upgrade to a new cellphone at a reduced cost.

    (a) Use a 99% confidence interval to estimate the percentage of subscribers who would upgrade to a new cell-phone at a reduced cost.
    (b) How could the manager in charge of promotional programs use the results in **(a)**?

2. In a survey of 1,003 adults concerning complaints about restaurants, 732 complained about dirty or ill-equipped bathrooms and 381 complained about loud or distracting diners at other tables. [⌘]

    (a) Construct a 95% confidence interval estimate of the percentage of adults who complained about dirty or ill-equipped bathrooms.
    (b) Construct a 95% confidence interval estimate of the percentage of adults who complained about loud or distracting diners at other tables.
    (c) How could the manager of a chain of restaurants use the results of (a) and (b)?

3. According to a TimeTrade survey, 26.2% of the more than 2,000 consumers surveyed value personalized experience most. [❖]

    (a) Construct a 95% confidence interval to estimate the proportion of consumers who value personalized experience most when shopping in a retail store if the sample size is 1,000?
    (b) Construct a 95% confidence interval to estimate the proportion of consumers who value personalized experience most when shopping in a retail store if the sample size is 2,000?
    (c) Based on (a) and (b), could you claim that more than a quarter of all consumers value personalized experience most when shopping in a retail store?

4. A Pew Research Center survey of 4,787 adults found that 4,178 had bought something online. Of these online shoppers, 789 are weekly online shoppers.

    (a) Construct a 95% confidence interval estimate of the percentage of adults who had bought something online.
    (b) Construct a 95% confidence interval estimate of the percentage of online shoppers who are weekly online shoppers.
    (c) How could the director of e-commerce sales for a company use the results of (a) and (b)?

5. In 1920, only 35% of U.S. households had telephones. A recent survey of 4276 randomly selected households showed that 4019 of them had telephones (based on data from the U.S. Census Bureau).

    (a) Construct and interpret the 99% confidence interval for the proportion of U.S. households having a telephone.
    (b) Based on this confidence interval, should those conducting surveys by telephone be concerned?

6. In a Gallup poll of 491 randomly selected U.S. adults asked whether or not they are in favor of the death penalty for a person convicted of murder, 320 responded in favor of the death penalty.

    (a) Determine the 95% confidence interval for the percentage of U.S. adults who are in favor of the death penalty.
    (b) Based on this confidence interval, explain why we can or cannot conclude that the majority of U.S. adults are in favor of the death penalty.

7. In a study of reading habits, 1017 people were surveyed regarding the number of books that they had read during the past year. The researcher found that those surveyed had read, on average, approximately 11.3 books and the standard deviation for the number of books that those surveyed had read during the year was approximately 16.6 books.

    (a) Construct and interpret the 90%, 95%, 96%. 98% and 99% confidence interval for the mean number of books that people read during a year.
    (b) Compare these confidence intervals and their margins for error. What is the relationship among the level of confidence, the margin for error, and the length of the confidence interval?