

SECTION 13.1 EXERCISES

Concept/Writing Exercises

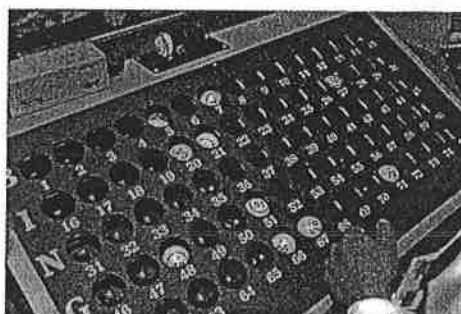
1. Define *statistics* in your own words.
2. Explain the difference between descriptive and inferential statistics.
3. When you hear the word *statistics*, what specific words or ideas come to mind?
4. Attempt to list at least two professions in which no aspect of statistics is used.
5. Name five areas other than those mentioned in this section in which statistics is used.
6. Explain the difference between probability and statistics.
7. a) What is a population?
b) What is a sample?
8. a) What is a systematic sample?
b) How might a systematic sample be selected?
9. a) What is a random sample?
b) How might a random sample be selected?
10. a) What is a cluster sample?
b) How might a cluster sample be selected?
11. a) What is a stratified sample?
b) How might a stratified sample be selected?
12. a) What is a convenience sample?
b) How might a convenience sample be selected?
13. What is an unbiased sample?
14. **Family Size** The principal of an elementary school wishes to determine the "average" family size of the children who attend the school. To obtain a sample, the principal visits each room and selects the four students closest to each corner of the room. The principal asks each of these students how many people are in his or her family.
 - a) Will this technique result in an unbiased sample? Explain your answer.
 - b) If the sample is biased, will the average be greater than or less than the true family size? Explain.

Practice the Skills

Sampling Techniques In Exercises 15–24, identify the sampling technique used to obtain a sample. Explain your answer.

15. A group of people are classified according to age and then random samples of people from each group are taken.
16. Every 15th CD player coming off an assembly line is checked for defects.
17. A state is divided into regions using zip codes. A random sample of 20 zip code areas is selected.

18. A door prize is given away at a teachers' convention. Tickets are placed in a bin and the tickets are mixed up. Then a ticket is selected by a blindfolded person.
19. Every 17th person in line to buy tickets for a rock concert is asked his or her age.
20. The businesses in Iowa City are grouped according to type: medical, service, retail, manufacturing, financial, construction, restaurant, hotel, tourism, and other. A random sample of 10 businesses from each type is selected.
21. The first 25 students leaving the cafeteria are asked how much money they spent on textbooks for the semester.
22. The Food and Drug Administration randomly selects five stores from each of four randomly selected sections of a large city and checks food items for freshness. These stores are used as a representative sample of the entire city.
23. Bingo balls in a bin are shaken and then balls are selected from the bin.



24. The Student Senate at the University of New Orleans is electing a new president. The first 25 people leaving the library are asked for whom they will vote.

Challenge Problems/Group Activities

25. a) **Random Sampling** Select a topic and population of interest to which a random sampling technique can be applied to obtain data.
b) Explain how you or your group would obtain a random sample for your population of interest.
c) Actually obtain the sample by the procedure stated in part (b).
26. **Data from Questionnaire** Some subscribers of *Consumer Reports* respond to an annual questionnaire regarding their satisfaction with new appliances, cars, and other items. The information obtained from these questionnaires is then used as a sample from which frequency of repairs and other ratings are made by the magazine. Are the data obtained from these returned questionnaires representative of the entire population or are they biased? Explain your answer.