12-9 Skills Practice

Sampling and Error

Determine whether each situation would produce a random sample. Write *yes* or *no* and explain your answer.

1. calling households at 3:30 P.M. on Tuesday to determine a political candidate's support

   no - must registered voters likely to be at work.

2. polling customers as they exit a sporting goods store about their attitudes about exercise

   no - customers likely to value exercise more than those who don't shop there.

3. recording the number of sit-ups performed by 15-year old girls in the high schools of a large school district to determine the fitness of all high-school girls in the district

   no - 15 yr olds may not have same ability of all students

4. selecting two of a city's 20 apartment buildings for a survey to determine the desire of apartment dwellers in the city to own a home

   no - residents selected could have nicer apartments or be in a nicer area of town or vice versa.

5. In a large school district, the superintendent of schools interviews two teachers at random from each school to determine whether teachers in the district think students are assigned too much or too little homework.

   yes - teachers from all levels selected at random.

6. For seven consecutive days, one hour each in the morning, afternoon, and evening, every tenth customer who enters a mall is asked to choose her or his favorite store.

   yes - sample is chosen over course of week, different times and is systematic - every 10th person

Find the margin of sampling error to the nearest percent.

7. $p = 85\%, n = 100$ *≈ 7%*

8. $p = 78\%, n = 100$ *≈ 8%*

9. $p = 15\%, n = 100$ *≈ 7%*

10. $p = 37\%, n = 500$ *≈ 4%*

11. $p = 12\%, n = 500$ *≈ 3%*

12. $p = 93\%, n = 500$ *≈ 2%*

13. $p = 23\%, n = 1000$ *≈ 3%*

14. $p = 56\%, n = 1000$ *≈ 3%*

15. **HEALTH** In a recent poll of cigarette smokers, 67% of those surveyed said they had tried to quit smoking within the last year. The margin of error was 3%. About how many people were surveyed?

   about 983

12-9 Practice

Sampling and Error

Determine whether each situation would produce a random sample. Write *yes* or *no* and explain your answer.

1. calling every twentieth registered voter to determine whether people own or rent their homes in your community

   no- registered voters could be more likely to be homeowners

2. predicting local election results by polling people in every twentieth residence in all the different neighborhoods of your community

   ~~the customers more likely to have exercise~~
   yes- all neighbourhoods represented proportionally

3. to find out why not many students are using the library, a school's librarian gives a questionnaire to every tenth student entering the library

   no- polling only students who come to library

4. testing overall performance of tires on interstate highways only

   no- need to test on all surfaces

5. selecting every 50th hamburger from a fast-food restaurant chain and determining its fat content to assess the fat content of hamburgers served in fast-food restaurant chains throughout the country *no - selected hamburgers are only random in 1 chain*

6. assigning all shift workers in a manufacturing plant a unique identification number, and then placing the numbers in a hat and drawing 30 at random to determine the annual average salary of the workers *yes- numbers randomly chosen from all shift workers*

Find the margin of sampling error to the nearest percent.

7. $p = 26\%, n = 100$ *about 9%.*

8. $p = 55\%, n = 100$ *about 10%*

9. $p = 75\%, n = 500$ *about 4%*

10. $p = 14\%, n = 500$ *about 3%.*

11. $p = 96\%, n = 1000$ *about 1%.*

12. $p = 21\%, n = 1000$ *about 3%.*

13. $p = 34\%, n = 1000$ *about 3%.*

14. $p = 49\%, n = 1500$ *about 3%.*

15. $p = 65\%, n = 1500$ *about 2%.*

16. **COMPUTING** According to a poll of 500 teenagers, 43% said that they use a personal computer at home. What is the margin of sampling error? *about 4%.*

17. **TRUST** A survey of 605 people, ages 13–33, shows that 68% trust their parents more than their best friends to tell them the truth. What is the margin of sampling error? *about 4%.*

18. **PRODUCTIVITY** A study by the University of Illinois in 1995 showed an increase in productivity by 10% of the employees who wore headsets and listened to music of their choice while they were working. The margin of sampling error for the study was about 7%. How many employees participated in the study? *about 73*