Write

Choose a term from the box that best completes each statement.

convenience sample	subjective sample	volunteer sample
simple random sample	stratified random sample	cluster sample
cluster	systematic sample	parameter
statistic		

1. A professor divided his class into females and males, then randomly selected a sample from each group. The sample the professor obtained is a _____ .

2. The manager at a discount store determines the mean salary of all of the store workers. The mean salary is an example of a _____ because it describes all of the workers.

3. John is asked to select a sample of his favorite foods from the school cafeteria. This sample is an example of a _____ .

4. A quality control specialist tests every 100th tablet that comes off the line. This sample is an example of a _____ .

5. In order to get a set of data of girl's heights, Risa uses the heights of all the girls in her class. This is an example of a _____ .

6. A college randomly selects 100 out of the 600 students who have taken the GRE exam and records their scores. The mean of these test scores is a _____ because it describes a sample.

7. A city manager randomly selects one block in the city and surveys all of the residents of that block. This type of sample is a _____ .

8. An online newspaper asks its readers to answer a question about their satisfaction with the content of the paper. This data collected from the survey results represents a

_____ .

9. A theater owner randomly selects 15 different customers to receive free tickets to the next show. This sample is a _____ .

10. A researcher wants to collect data from a state. He divides the state into 16 regions and randomly chooses one of the regions to interview all of its residents. Each of the 16 regions is an example of a

_____ .

Remember

There are many different types of sampling methods to use when collecting data. None of the methods are entirely free from bias, but some methods provide more of an equal chance for a member of the population to be selected.

Practice

Twenty-four professional athletes are participating in a charity golf tournament. Each golfer has been given an identification number from 01 through 24. Golfers 01 through 12 are professional football players and golfers 13 through 24 are professional baseball players. Par for the course is 72. The table shows the golfers' tournament scores after the first round.

Golfer ID Number	Score	Golfer ID Number	Score
01	72	13	79
02	75	14	85
03	69	15	67
04	78	16	75
05	80	17	68
06	68	18	76
07	81	19	68
08	72	20	69
09	74	21	71
10	77	22	76
11	75	23	70
12	77	24	74

1. Create a simple random sample of 6 scores from the table. Explain how you created your sample. Then calculate the average of your sample.
2. Create a stratified random sample of 6 scores from the table. Explain how you created this sample. Then calculate the average of this sample.
3. Create a cluster sample of 6 scores from the table. Explain how you created this sample. Then calculate the average of this sample.
4. Create a systematic sample of 6 scores from the table. Explain how you created this sample. Then calculate the average of this sample.
5. The actual average score is 74. Which of your sample averages was closest to the actual average? Is this what you expected? Explain.

Stretch

1. Data is collected for each state every year on the number of workplace fatalities. The table shows the data all 50 states plus the District of Columbia in the year 2016.

State	Number Of Fatalities	State	Number Of Fatalities	State	Number Of Fatalities	State	Number of Fatalities
Alabama	100	Indiana	137	Nevada	54	Tennessee	122
Alaska	35	Iowa	76	New Hampshire	22	Texas	145
Arizona	77	Kansas	74	New Jersey	101	Utah	44
Arkansas	68	Kentucky	92	New Mexico	41	Vermont	10
California	376	Louisiana	95	New York	272	Virginia	153
Colorado	81	Maine	18	North Carolina	56	Washington	78
Connecticut	28	Maryland	92	North Dakota	174	West Virginia	47
Delaware	12	Massachusetts	109	Ohio	28	Wisconsin	105
District of Columbia	5	Michigan	162	Oklahoma	164	Wyoming	34
Florida	309	Minnesota	92	Oregon	92		
Georgia	171	Mississippi	71	Pennsylvania	72		
Hawaii	29	Missouri	124	Rhode Island	163		
Idaho	30	Montana	38	South Carolina	9		
Illinois	171	Nebraska	60	South Dakota	96		

a. Calculate the mean number of workplace fatalities for all of the states in the year 2016.

b. Create a simple random sample of 10 scores from the table. Explain how you created your sample.

c. Calculate the mean of your sample and compare it to the mean number of fatalities for all the states. Explain your reasoning.

d. Explain how you can create a stratified random sample of 10 workplace fatalities from the states data.

2. A company asked a polling firm to conduct several polls for upcoming elections. Determine the requested values for each poll result.

a. For candidate A, the company polled 500 voters and found that 42.2% favored the candidate. How many voters favored the candidate?

b. For candidate B, 662 out of 1000 polled voters favored the candidate. What percentage of voters favored the candidate?

c. For candidate C, 763 voters favored the candidate. This was approximately 38% of the total number of voters polled. Approximately how many voters did the firm poll?

d. The proportion of voters polled who would vote for Candidate D was 0.653. If 800 voters were polled, approximately how many of the voters polled would vote for Candidate D?

Review

1. A researcher wants to know whether elementary school students enrolled in music classes do better on standardized math tests. He gathers data from 10 different elementary schools that have records for all of their students.

a. Is the given method of data collection a sample survey, an observational study, or an experiment? Explain your reasoning.

b. Identify the population, the sample, and the characteristic of interest.

2. You want to perform an experiment to determine the support for a new stadium at the local high school. You choose a random sample of 40 senior citizens and interview them to represent the population for your experiment. Explain how this sampling method is biased.

3. Two produce stands at a farmer's market sell watermelons for $5.99 each. The watermelons sold at Bev's Fresh Picks have a mean weight of 20 pounds and a standard deviation of 1.5 pounds. The watermelons sold at Frank's Produce have a mean weight of 19.5 pounds and a standard deviation of 2 pounds. Assume the watermelon weights are normally distributed.

a. Fenna is having a picnic and would like a watermelon that is at least 21 pounds. From which stand would Fenna have a higher probability of getting the watermelon she wants? Explain your reasoning.

b. Grace would like a watermelon that is less than 19 pounds for her pool party. From which stand would Grace have a higher probability of getting the watermelon she wants? Explain your reasoning.

4. Solve each equation.

a. $2 \cdot 3^{x + 2} - 5 = 15$

b. $\log_4 (x + 3) - \log_4 x = 2$