

## CHAPTER 1 Review

1. You measure the age (years), weight (pounds), and marital status (single, married, divorced, or widowed) of 1400 women. How many variables did you measure?  
(a) 1400      (b) one      (c) two      (d) three      (e) 1403

2. A forester surveys a sample of trees in a certain state forest and records the following information about each tree: species, height, diameter of trunk 4 feet above the ground, and type of leaves (needle or broadleaf). The quantitative variables he recorded are:

- (a) height only.
- ~~(b) species only.~~
- (c) diameter of trunk only.
- (d) (a) and (c)
- (e) all four variables are quantitative.

3. The sequence of steps in the statistical problem-solving process is:

- ~~(a) Produce data, ask a question of interest, analyze data, interpret results.~~
- ~~(b) Produce data, interpret results, ask a question of interest, analyze data.~~
- ~~(c) Produce data, interpret results, analyze data, ask a question of interest.~~
- ~~(d) Ask a question of interest, produce data, interpret results, analyze data.~~
- (e) Ask a question of interest, produce data, analyze data, interpret results.

**The next four questions concern the following scenario:**

A scientist studying the behavior of wolves in North America collects the following information about a pack of six wolves near his research station:

- Each wolf's gender.
- Each wolf's height (measured from photographs!).
- The average number of hours per day each wolf spends hunting.
- Whether each wolf prefers to hunt in the woods, in fields, or shows no preference.
- An estimate of the average total weight of food eaten per day by each wolf.

4. This is an example of

- (a) an experiment.
- (b) a census.
- (c) an observational study.
- (d) both (a) and (c).
- (e) none of these.

5. Which of the following best describes the variables that are being measured?

- (a) five quantitative variables.
- (b) one categorical variable and four quantitative variables.
- (c) two categorical variables and three quantitative variables.
- (d) three categorical variables and two quantitative variables.
- (e) four categorical variables and one quantitative variable.

6. Which of the following statements about the usefulness of this study are true?
- (a) The scientist cannot draw any conclusions about cause and effect relationships between, for example, where a wolf prefers to hunt and the number of hours spent hunting because he did not perform an experiment.
  - (b) The scientist should be cautious about drawing conclusions about all wolves on the basis of this study because this pack may not be representative of all wolves in North America.
  - (c) If the scientist studied another pack of wolves in a different area, he can expect to get results very similar to the results from this pack.
  - (d) both (a) and (b) are true.
  - (e) All three statements are true.

7. Which of the following “questions of interest” might be addressed by the data produced in this study?

- (a) Do male wolves travel farther during hunting expeditions than female wolves?
- (b) Is there a difference between the amount of time female and male wolves spend attending to wolf pups?
- (c) Do larger wolves spend more time hunting than smaller wolves?
- (d) Is there a relationship between a wolf's age and where he prefers to hunt?
- (e) Do older wolves eat less food per day?

8. Many statisticians feel that a well-designed sample survey of U.S. households would provide more accurate information than the U.S. Census, even though the sample would provide information about a smaller number of individuals than the Census. Which of the following best describes the advantage of sampling?

- (a) The set of questions asked on a sample survey are more informative than those that are asked on the Census.
- (b) The sample survey gathers information on every individual in a household, not just the “head of household.”
- (c) The sample survey includes individuals from rural areas that the census does not.
- (d) The census is likely to count some people twice and not count others.
- (e) The census does not include people living in the District of Columbia.

— overcounting

9. Your school has exactly 500 female students and 500 male students. You sit at the front door one morning and record the gender of the first 50 students who walk in the door. Which of the following best describes the results you expect?

- (a) You are equally likely to get anywhere from 0 to 50 males in your sample of 50 students.
- (b) You will always get 25 males and 25 females.
- (c) You will get 25 males and 25 females 98% of the time.
- (d) Most of the time, you will get close to 25 males and 25 females, but rarely exactly that many.
- (e) It is impossible to predict anything about the number of males and females you will get in your sample.

10. Experiments are the best type of study for providing evidence for cause and effect because

- (a) experiments can isolate the impact of a single difference between two otherwise similar subject groups.
- (b) experiments are the only kind of study that allow you to compare two or more distinct groups of individuals.
- (c) experiments are not subject to random variation.
- (d) experiments involve more individuals than other study designs.
- (e) experiments are less expensive to conduct than other study designs.

11. A manufacturer's quality-control department wants to ensure that 100-watt light bulbs produced by the manufacturer are meeting predetermined standards for how long they last before burning out. They randomly select 50 bulbs from a recent manufacturing run of 100,000 (100-watt) bulbs and leave them on until they burn out, recording how long they last (in hours). The population in this study appears to be:

- (a) The 50 selected bulbs.
- (b) All 100-watt bulbs produced by this manufacturer in the last six months.
- (c) The 100,000 bulbs in this manufacturing run.
- (d) All 100-watt bulbs produced by any manufacturer.
- (e) Any group of 50 randomly-selected bulbs from this manufacturing run.

12. A company database contains the following information about each employee: age, date hired, sex (male or female), ethnic group (Asian, black, Hispanic, etc.), job category (clerical, management, technical, etc.), yearly salary. Which of the following lists of variables are *all* categorical?

- (a) age, sex, ethnic group.
- (b) sex, ethnic group, job category.
- (c) ethnic group, job category, yearly salary.
- (d) yearly salary, age.
- (e) age, date hired.

13. Suppose that in a certain population of voters, 60% favor candidate Doe. If you took 40 different samples of 100 voters from this population, which of the following best describes the results you would expect from these samples?

- (a) Sixty percent of the voters in each of the samples would favor candidate Doe.
- (b) The percentage of voters in the sample who favor candidate Doe would vary, but most would be close to 60%.
- (c) Exactly 60% of the voters in 95% of the samples would favor candidate Doe, but in the other 5%, you would get a different result.
- (d) In 60% of the samples, the majority of voters would favor candidate Doe?
- (e) It is not possible to make any generalizations about so many different samples.

14. A national sample survey interviewed 3,800 people age 18 and older nationwide by telephone. One question asked was whether they agreed with this statement: "Some people say we should have a third major political party in this country in addition to the Democrats and Republicans." The population for this sample survey appears to be

(a) all adult residents of the U.S.

(b) all registered voters.

(c) the 3,800 people who were interviewed.

(d) people who think we should have a third political party.

(e) all U.S. citizens.

15. The goal of the statistical problem-solving process is:

(a) Organize the process of gathering information so data that is collected helps answer a pre-determined question of interest.

(b) Draw meaningful information from data in the face of variation.

(c) Make sense of data by using methods that eliminate the impact of variation on results.

(d) (a) and (b)

(e) (a), (b) and (c).

16. You measure the age, marital status, and earned income of an SRS of 1463 women. The number of variables you have measured is

(a) 1463 -- the size of the sample

(b) four -- age, marital status, income, and number of women

(c) three -- age, marital status, and income

(d) two -- age and income. Marital status is not a variable because it doesn't have a unit like years or dollars.

(e) one -- income is the only quantity that is variable.