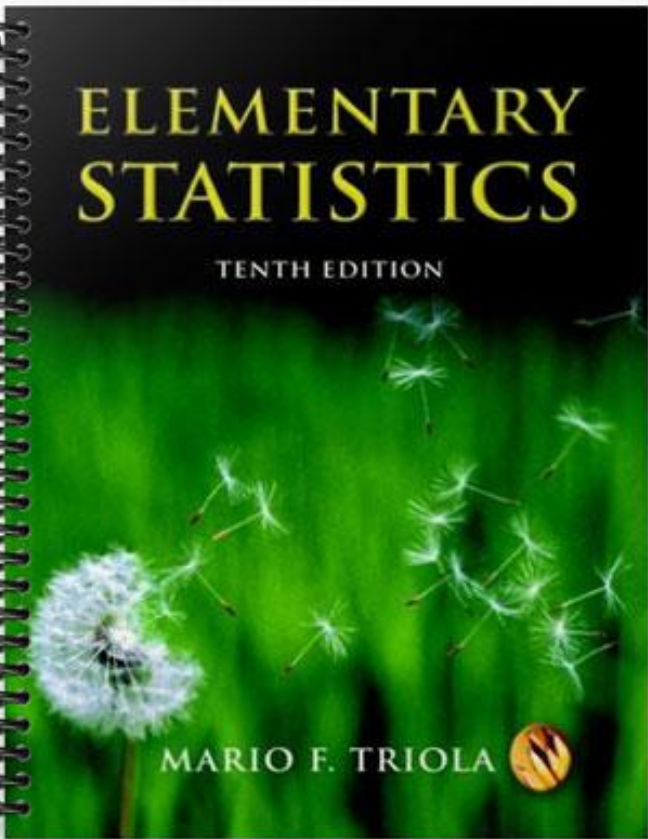


TEST BANK

ELEMENTARY STATISTICS

TENTH EDITION

MARIO F. TRIOLA



PRINTED TEST BANK

JUSTINE C. BAKER

Peirce College, Philadelphia, PA

to accompany

THE TRIOLA STATISTICS SERIES:

Elementary Statistics, Tenth Edition

Elementary Statistics Using Excel, Third Edition

Essentials of Statistics, Third Edition

*Elementary Statistics Using
the TI-83/84 Plus Calculator, Second Edition*

Mario F. Triola

Dutchess Community College



Boston San Francisco New York
London Toronto Sydney Tokyo Singapore Madrid
Mexico City Munich Paris Cape Town Hong Kong Montreal



This work is protected by United States copyright laws and is provided solely for the use of instructors in teaching their courses and assessing student learning. Dissemination or sale of any part of this work (including on the World Wide Web) will destroy the integrity of the work and is not permitted. The work and materials from it should never be made available to students except by instructors using the accompanying text in their classes. All recipients of this work are expected to abide by these restrictions and to honor the intended pedagogical purposes and the needs of other instructors who rely on these materials.

Reproduced by Pearson Addison-Wesley from electronic files supplied by the author.

Copyright © 2007 Pearson Education, Inc.

Publishing as Pearson Addison-Wesley, 75 Arlington Street, Boston, MA 02116

All rights reserved. This manual may be reproduced for classroom use only. Printed in the United States of America.

ISBN 0-321-36914-9

1 2 3 4 5 6 BB 09 08 07 06



CONTENTS

Each test is immediately followed by its Answer Key.

	Page
Chapter 1	1
Chapter 2	16
Chapter 3	49
Chapter 4	67
Chapter 5	82
Chapter 6	100
Chapter 7	118
Chapter 8	133
Chapter 9	152
Chapter 10	173
Chapter 11	204
Chapter 12	222
Chapter 13	252
Chapter 14	275

CHAPTER 1 FORM A

Use critical thinking to develop an alternative conclusion.

- 7) In a study of headache patients, every one of the study subjects with a headache was found to be improved after taking a week off of work. Conclusion: Taking time off work cures headaches.

Use critical thinking to address the key issue.

- 8) An airline company advertises that 100% of their flights are on time after checking 5 randomly selected flights and finding that these 5 were on time.

- 9) "38% of adults in the United States regularly visit a doctor". This conclusion was reached by a college student after she had questioned 520 randomly selected members of her college. What is wrong with her survey?

Perform the requested conversions. Round decimals to the nearest thousandth and percents to the nearest tenth of a percent, if necessary.

- 10) Convert 0.4 to an equivalent fraction and percentage.

A) $\frac{3}{10}$, 40% B) $\frac{2}{5}$, 40% C) $\frac{3}{10}$, 4% D) $\frac{2}{5}$, 4%

- 11) Convert 90% to an equivalent fraction and decimal.

A) $\frac{4}{5}$, 9 B) $\frac{9}{10}$, 9 C) $\frac{9}{10}$, 0.9 D) $\frac{4}{5}$, 0.9

CHAPTER 1 FORM A

Solve the problem.

- 12) On a test, if 125 questions are answered and 68% of them are correct, what is the number of correct answers?
- A) 54 B) 62 C) 85 D) 90

Is the description an observational study or an experiment?

- 13) A stock analyst compares the relationship between stock prices and earnings per share to help him select a stock for investment.
- A) Observational study B) Experiment
- 14) A T.V. show's executives raised the fee for commercials following a report that the show received a "No. 1" rating in a survey of viewers.
- A) Experiment B) Observational study

Identify the type of observational study.

- 15) A town obtains current employment data by polling 10,000 of its citizens this month.
- A) Retrospective B) Cross-sectional
- C) Prospective D) None of these

Identify which of these types of sampling is used: random, stratified, systematic, cluster, convenience.

- 16) 49, 34, and 48 students are selected from the Sophomore, Junior, and Senior classes with 496, 348, and 481 students respectively.
- A) Convenience
- B) Cluster
- C) Random
- D) Systematic
- E) Stratified
- 17) A sample consists of every 49th student from a group of 496 students.
- A) Convenience
- B) Random
- C) Cluster
- D) Stratified
- E) Systematic

CHAPTER 1 FORM A

18) The name of each contestant is written on a separate card, the cards are placed in a bag, and three names are picked from the bag.

- A) Convenience
- B) Stratified
- C) Cluster
- D) Random
- E) Systematic

Provide an appropriate response.

19) Explain what is meant by the term "confounding" and give an example of an experiment in which confounding is likely to be a problem.

20) A researcher wants to obtain a sample of 100 school teachers from the 800 school teachers in a school district. Describe procedures for obtaining a sample of each type: random, systematic, convenience, stratified, cluster.

Answer Key

Testname: CHAPTER 1 FORM A

- 1) In random sampling, each member of the population has an equal chance of being selected. Random sampling provides us with the best representative sample in which all groups of the population are approximately proportionately represented. Careless sampling can easily result in a biased sample which may be useless.
- 2) A
- 3) B
- 4) D
- 5) C
- 6) Sample: the 3 selected customers; population: all customers; not representative
- 7) Headaches generally last for only a few hours, so anything would seem like a cure. There is no evidence to suggest that taking time off work will cure a headache.
- 8) The sample was too small.
- 9) The sample is biased. College students are not representative of the U.S. population as a whole.
- 10) B
- 11) C
- 12) C
- 13) A
- 14) B
- 15) B
- 16) E
- 17) E
- 18) D
- 19) Confounding occurs in an experiment when the effects of two or more variables cannot be distinguished from each other. Examples will vary.
One example is that of a school district that conducts a study regarding whether the science laboratory approach or the computer simulation approach is better for learning chemistry among seniors. One school is randomly selected to conduct only science labs; the other, only computer simulations. A standardized achievement test is used to measure learning, and the results of the two schools are compared. Unless controlled in the study, two confounding variables are teaching expertise and student motivation.
- 20) Answers will vary.
One answer is as follows. (1) Random: List the names of the teachers in alphabetical order from 1 through 800. Select 100 teachers by a random number computer program.
(2) Systematic: Blindly select from a box one of eight index cards, each of which has a number from 1 to 8 written on it. Sample from the alphabetized list, beginning with that number followed by all its integral multiples until 100 teachers are selected.
(3) Convenience: Offer an incentive to the teachers, and select the first 100 volunteers. (4) Stratified: Prepare an alphabetized list of teachers by school (i.e., strata) and randomly select teachers in proportion to school size until 100 teachers are selected.
(5) Cluster: Form 8 clusters from 8 consecutive blocks of 100 teachers in the alphabetized list. Blindly draw an index card from the box, and whichever card is drawn, all 100 teachers in that cluster will be the sample. Making clusters from the individual schools might not work, since the school or schools randomly selected might not have 100 teachers in total.

CHAPTER 1 FORM B

Name: _____ Course Number: _____ Section Number: _____

Directions: Write your answers to the short-answer items in the spaces provided.
Circle the correct choice for multiple-choice items.

Provide an appropriate response.

- 1) Define sampling error and nonsampling error. Give examples of nonsampling error.

Determine whether the given value is a statistic or a parameter.

- 2) After inspecting all of 55,000 kg of meat stored at the Wurst Sausage Company, it was found that 45,000 kg of the meat was spoiled.

A) Statistic

B) Parameter

Identify the number as either continuous or discrete.

- 3) The number of stories in a Manhattan building is 22.

A) Continuous

B) Discrete

Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate.

- 4) Student's grades, A, B, or C, on a test.

A) Ordinal

B) Ratio

C) Nominal

D) Interval

- 5) Ages of survey respondents.

A) Ordinal

B) Ratio

C) Interval

D) Nominal

Identify the sample and population. Also, determine whether the sample is likely to be representative of the population.

- 6) In a poll of 50,000 randomly selected college students, 74% answered "yes" when asked "Do you have a television in your dorm room?"

CHAPTER 1 FORM B

Use critical thinking to develop an alternative conclusion.

- 7) A study shows that adults who work at their desk all day weigh more than those who do not. Conclusion: Desk jobs cause people to gain weight.

Use critical thinking to address the key issue.

- 8) You plan to make a survey of 200 people. The plan is to talk to every 10th person coming out of the school library. Is there a problem with your plan?

- 9) A questionnaire is sent to 10,000 persons. 5,000 responded to the questionnaire. 3,000 of the respondents say that they "love chocolate ice cream". We conclude that 60% of people love chocolate ice cream. What is wrong with this survey?

Perform the requested conversions. Round decimals to the nearest thousandth and percents to the nearest tenth of a percent, if necessary.

- 10) Convert 90% to an equivalent fraction and decimal.

A) $\frac{4}{5}$, 9

B) $\frac{4}{5}$, 0.9

C) $\frac{9}{10}$, 0.9

D) $\frac{9}{10}$, 9

- 11) Convert $\frac{17}{150}$ to an equivalent decimal and percent.

A) 0.113, 11.3%

B) 0.113, 1.13%

C) 0.233, 233%

D) 0.233, 23.3%

CHAPTER 1 FORM B

Solve the problem.

- 12) On a test, if 80 questions are answered and 36% of them are correct, what is the number of correct answers?
- A) 50 B) 45 C) 32 D) 29

Is the description an observational study or an experiment?

- 13) A quality control specialist compares the output from a machine with a new lubricant to the output of machines with the old lubricant.
- A) Experiment B) Observational study
- 14) A stock analyst selects a stock from a group of twenty for investment by choosing the stock with the greatest earnings per share reported for the last quarter.
- A) Experiment B) Observational study

Identify the type of observational study.

- 15) A statistical analyst obtains data about ankle injuries by examining a hospital's records from the past 3 years.
- A) Cross-sectional B) Retrospective
C) Prospective D) None of these

Identify which of these types of sampling is used: random, stratified, systematic, cluster, convenience.

- 16) A market researcher selects 500 drivers under 30 years of age and 500 drivers over 30 years of age.
- A) Random
B) Convenience
C) Systematic
D) Cluster
E) Stratified
- 17) A market researcher selects 500 people from each of 10 cities.
- A) Systematic
B) Stratified
C) Convenience
D) Cluster
E) Random

CHAPTER 1 FORM B

- 18) An education researcher randomly selects 48 middle schools and interviews all the teachers at each school.
- A) Systematic
 - B) Convenience
 - C) Cluster
 - D) Stratified
 - E) Random

Provide an appropriate response.

- 19) A researcher obtains a sample of high school teachers in his school district by randomly selecting 10 high schools and interviewing all the teachers at each of these 10 schools. What kind of sampling is being used here? Will the resulting sample be a simple random sample of the population of teachers in the school district? Explain your thinking.

- 20) Why do you think that cluster sampling is frequently used in practice?

Answer Key

Testname: CHAPTER 1 FORM B

- 1) Sampling error is the difference between a sample result and the true population result. Such an error results from chance sample fluctuations. A nonsampling error occurs when the sample data are incorrectly collected, recorded, or analyzed. Examples include nonrandom samples, defective measuring instruments, biased survey questions, a large number of refusals, copying sample data incorrectly.
- 2) B
- 3) B
- 4) A
- 5) B
- 6) Sample: the 50,000 selected college students; population: all college students; representative
- 7) Desk job workers are confined to their chairs for most of their work day. Other jobs require standing or walking around which burns calories. It is probably the lack of exercise that causes higher weights, not the desk job itself. Avoid causality altogether by saying lack of walking and exercise is associated with higher weights.
- 8) People who don't go to the library are excluded.
- 9) This is not a random sample. The survey is based on voluntary, self-selected responses and therefore has serious potential for bias.
- 10) C
- 11) A
- 12) D
- 13) A
- 14) B
- 15) B
- 16) E
- 17) D
- 18) C
- 19) This is cluster sampling. The sample obtained will not be a simple random sample of all high school teachers in the district because different samples have different chances of being selected.
- 20) Answers will vary. Possible answer: Cluster sampling can save time and money and be more efficient, especially when the clusters are geographically far apart from each other. For example, if a researcher wishes to interview a sample of high school teachers in a school district, it will be easier to interview all the teachers at a few schools than to interview a few teachers from many different schools.

CHAPTER 1 FORM C

- 7) A study of achievement scores by sixth-grade students on a standardized math test showed the three top scorers were all gifted piano players. Conclusion: Playing the piano leads to mathematical achievement.

Use critical thinking to address the key issue.

- 8) A researcher published this survey result: "74% of people would be willing to spend 10 percent more for energy from a non-polluting source". The survey question was announced on a national radio show and 1,200 listeners responded by calling in. What is wrong with this survey?

- 9) A researcher wished to gauge public opinion on gun control. He randomly selected 1000 people from among registered voters and asked them the following question: "Do you believe that gun control laws which restrict the ability of Americans to protect their families should be eliminated?". Identify the abuse of statistics and suggest a way the researcher's methods could be improved.

Perform the requested conversions. Round decimals to the nearest thousandth and percents to the nearest tenth of a percent, if necessary.

- 10) Convert 0.328 to an equivalent fraction and percent.

A) $\frac{41}{125}$, 32.8% B) $\frac{8}{25}$, 3.28% C) $\frac{41}{125}$, 3.28% D) $\frac{8}{25}$, 32.8%

- 11) Convert 2.75 to an equivalent fraction and percent.

A) $2\frac{3}{4}$, 27.5% B) $2\frac{1}{2}$, 27.5% C) $2\frac{3}{4}$, 275% D) $2\frac{1}{2}$, 275%

CHAPTER 1 FORM C

Solve the problem.

- 12) Alex and Juana went on a 95-mile canoe trip with their class. On the first day they traveled 19 miles. What percent of the total distance did they canoe?
- A) 0.2% B) 20% C) 500% D) 5%

Is the description an observational study or an experiment?

- 13) A T.V. show's executives commissioned a study to gauge the impact of the show's ratings on the sales of its advertisers.
- A) Experiment B) Observational study
- 14) A doctor performs several diagnostic tests to determine the reason for a patient's illness.
- A) Experiment B) Observational study

Identify the type of observational study.

- 15) Researchers collect data by interviewing athletes who have won olympic gold medals from 1980 to 1992.
- A) Cross-sectional B) Retrospective
- C) Prospective D) None of these

Identify which of these types of sampling is used: random, stratified, systematic, cluster, convenience.

- 16) A tax auditor selects every 1000th income tax return that is received.
- A) Random
- B) Systematic
- C) Stratified
- D) Convenience
- E) Cluster
- 17) A pollster uses a computer to generate 500 random numbers, then interviews the voters corresponding to those numbers.
- A) Cluster
- B) Convenience
- C) Systematic
- D) Random
- E) Stratified

CHAPTER 1 FORM C

- 18) To avoid working late, a quality control analyst simply inspects the first 100 items produced in a day.
- A) Random
 - B) Systematic
 - C) Stratified
 - D) Cluster
 - E) Convenience

Provide an appropriate response.

- 19) A market researcher obtains a sample of 50 people by standing outside a store and asking every 20th person who enters the store to fill out a survey until she has 50 people. What sampling method is being used here? Will the resulting sample be a random sample? Will it be a simple random sample? Explain your thinking.
- 20) A teacher at a school obtains a sample of students by selecting a random sample of 20 students from each grade. What kind of sampling is being used here? Will the resulting sample be a simple random sample of the population of students at the school? Explain your thinking.

Answer Key

Testname: CHAPTER 1 FORM C

- 1) In an observational study, we observe and measure specific characteristics, but we don't attempt to manipulate or modify the subjects being studied. In an experiment we apply some treatment and then proceed to observe its effects on the subjects. In the experiment, the group receiving the treatment is called the treatment group. The control group is the group that is not given the treatment.
- 2) B
- 3) A
- 4) C
- 5) C
- 6) Sample: the 100,000 selected adults; population: all adults; representative
- 7) A sample of 3 among many students is not sufficient to conclude that playing the piano is conducive to math achievement. Student motivation and interest in math should be considered as factors.
- 8) This is not a random sample. The survey is based on voluntary, self-selected responses and therefore has serious potential for bias.
- 9) The question is loaded. A more neutral way to phrase the question would be, for example, "Do you believe that gun control laws should be strengthened, weakened, or left in their current form?".
- 10) A
- 11) C
- 12) B
- 13) B
- 14) A
- 15) B
- 16) B
- 17) D
- 18) E
- 19) This is systematic sampling. The sample obtained will be a random sample because everyone has the same chance of being chosen but will not be a simple random sample as different samples of 50 people have different chances of being chosen.
Note: That the sample is random depends on the market researcher randomly selecting 20 as the starting point prior to research.
- 20) This is stratified sampling. The sample obtained will not be a simple random sample because different samples of students have different chances of being selected.

