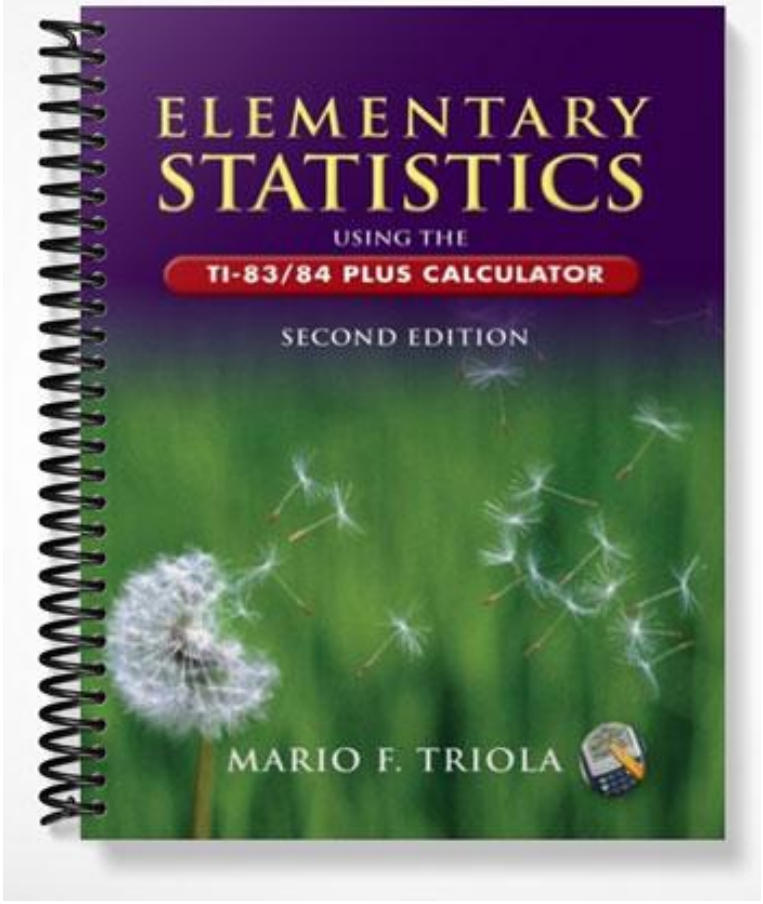
TEST BANK


ELEMENTARY
STATISTICS
USING THE
TI-83/84 PLUS CALCULATOR
SECOND EDITION
MARIO F. TRIOLA

PRINTED TEST BANK

JUSTINE C. BAKER

Peirce College, Philadelphia, PA

to accompany

THE TRIOLA STATISTICS SERIES:

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Mario F. Triola

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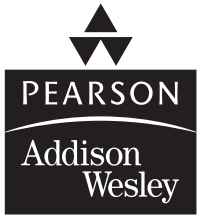

CONTENTS

Each test is immediately followed by its Answer Key.

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CHAPTER 1 FORM A

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 random sample. Explain why this is important in design of experiments.

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

2) A sample of 120 employees of a company is selected, and the average age is found to be 37 years.

A) Statistic B) Parameter

Identify the number as either continuous or discrete.

3) The number of freshmen entering college in a certain year is 621.

A) Continuous B) Discrete

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

4) Survey responses of "good, better, best".

A) Nominal B) Interval C) Ratio D) Ordinal

5) Salaries of college professors.

A) Interval B) Ordinal C) Ratio D) Nominal

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

6) An employee at the local ice cream parlor asks three customers if they like chocolate ice cream.

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

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

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.

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?".

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%

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

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?

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

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 observational study and experiment. Define the terms "treatment group" and "control group" as part of your answer.

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

2) After taking the first exam, 15 of the students dropped the class.

A) Statistic B) Parameter

Identify the number as either continuous or discrete.

3) The average height of all freshmen entering college in a certain year is 68.4 inches.

A) Continuous B) Discrete

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

4) Nationalities of survey respondents.

A) Ratio B) Interval C) Nominal D) Ordinal

5) Temperatures of the ocean at various depths.

A) Ratio B) Nominal C) Interval D) Ordinal

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

6) 100,000 randomly selected adults were asked whether they drink at least 48 oz of water each day and only 45% said yes.

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%

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

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.

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.

CHAPTER 2 FORM A

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) Histograms and Pareto charts are both bar charts. What is the significant difference between the two?

2) Suppose that a data set has a minimum value of 25 and a max of 75 and that you want 5 classes. Explain how to find the class width for this frequency table. What happens if you mistakenly use a class width of 10 instead of 11?

Solve the problem.

3) Using the employment information in the table on Alpha Corporation, determine the width of each class.

Years employed at Alpha Corporation

Class Limits (years of service)	Frequency (No. of employees)
1 – 5	5
6 – 10	20
11 – 15	25
16 – 20	10
21 – 25	5
26 – 30	3

A) 10 B) 4 C) 6 D) 5

4) Using the information in the table on home sale prices in the city of Summerhill for the month of June, find the class boundaries for class 80.0–110.9.

Class Limits (Sale price in thousands)	Frequency (No. of homes sold)
80.0 – 110.9	2
111.0 – 141.9	5
142.0 – 172.9	7
173.0 – 203.9	10
204.0 – 234.9	3
235.0 – 265.9	1

A) 79.90, 111.0 B) 79.95, 110.95 C) 79.90, 110.95 D) 80.00, 110.95

Construct the relative frequency distribution that corresponds to the given frequency distribution.

5)

Incomes	Frequency
200–300	69
301–400	73
401–500	81
501–600	65
>600	16

A)

Incomes	Relative Frequency
200–300	22.70%
301–400	24.01%
401–500	26.64%
501–600	21.38%
>600	5.26%

B)

Incomes	Relative Frequency
200–300	12.5%
301–400	20.1%
401–500	37.3%
501–600	15.2%
>600	14.9%

C)

Incomes	Relative Frequency
201–300	15.5%
301–400	22.1%
401–500	31.3%
501–600	16.2%
>600	14.9%

D)

Incomes	Relative Frequency
200–300	26.21%
301–400	21.59%
401–500	5.30%
501–600	22.40%
>600	26.30%

Solve the problem.

6) Use the high closing values of Naristar Inc. stock from the years 1990 – 2001 to construct a time–series graph. (Let x = 0 stand for 1990 and so on...) Identify a trend.

Year	High	Year	High
1990	42	1996	47
1991	40	1997	60
1992	31	1998	61
1993	42	1999	57
1994	44	2000	54
1995	47	2001	30

Construct the cumulative frequency distribution that corresponds to the given frequency distribution.

7)

Height (inches)	Frequency
69.0 – 71.9	15
72.0 – 74.9	17
75.0 – 77.9	16
78.0 – 80.9	15
81.0 – 83.9	17

A)

Height (inches)	Cumulative Frequency
69.0 – 71.9	0.188
72.0 – 74.9	0.212
75.0 – 77.9	0.200
78.0 – 80.9	0.188
81.0 – 83.9	0.212

B)

Height (inches)	Cumulative Frequency
69.0 – 71.9	15
72.0 – 74.9	32
75.0 – 77.9	48
78.0 – 80.9	63
81.0 – 83.9	80

C)

Height (inches)	Cumulative Frequency
69.0 – 71.9	15
72.0 – 74.9	32
75.0 – 77.9	48
78.0 – 80.9	61
81.0 – 83.9	80

D)

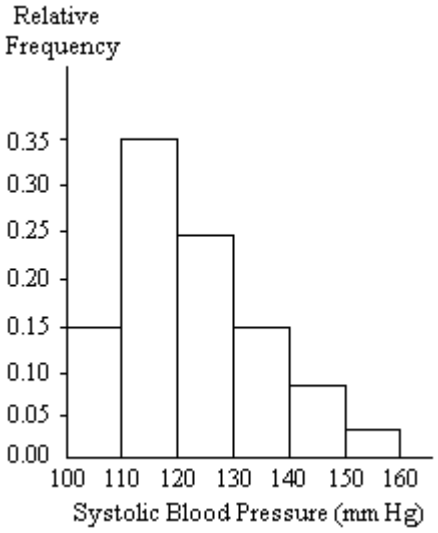
Height (inches)	Cumulative Frequency
69.0 – 71.9	32
72.0 – 74.9	48
75.0 – 77.9	63
78.0 – 80.9	80
81.0 – 83.9	97

Provide an appropriate response.

8) Sturges' guideline suggests that when constructing a frequency distribution, the ideal number of classes can be approximated by 1 + (log n)/(log 2), where n is the number of data values. Use this guideline to find the ideal number of classes when the number of data values is 50. Round your answer to the nearest whole number.

A) 9 B) 6 C) 8 D) 7

A nurse measured the blood pressure of each person who visited her clinic. Following is a relative–frequency histogram for the systolic blood pressure readings for those people aged between 25 and 40. Use the histogram to answer the question. The blood pressure readings were given to the nearest whole number.



9) Approximately what percentage of the people aged 25–40 had a systolic blood pressure reading between 110 and 119 inclusive?

A) 30% B) 3.5% C) 35% D) 0.35%

Provide an appropriate response.

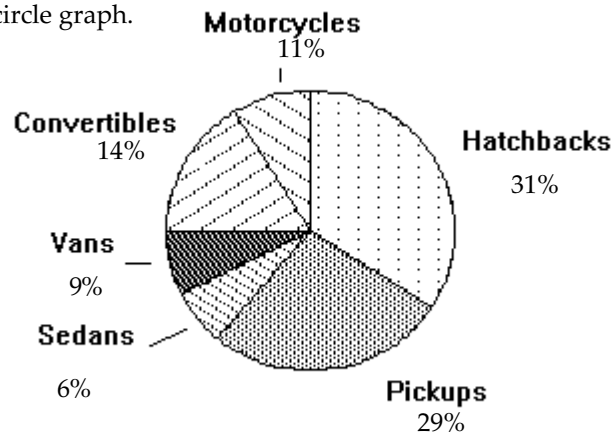
10) Suppose that a histogram is constructed for the frequency distribution shown below:

Age	Frequency
30–39	11
40–49	23
50–59	17
60–69	12
70–89	6

The class 60–69 has twice the frequency of the class 70–89. In the histogram, will the area of the bar for the class 60–69 be twice the area of the bar for the class 70–89? In other words, will areas be proportional to frequencies in this histogram? Explain your thinking. Are there any conditions under which areas are proportional to frequencies in histograms?

Use the pie chart to solve the problem.

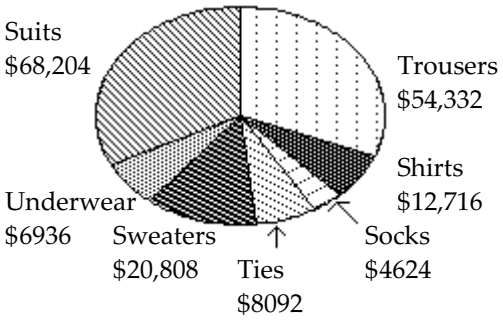
11) A survey of the 9225 vehicles on the campus of State University yielded the following circle graph.



Find the number of hatchbacks. Round your result to the nearest whole number.

A) 268 B) 286 C) 2860 D) 2675

12) The pie chart below gives the inventory of the men's department of a store.



What is the total inventory?

A) $121,380 B) $180,336 C) $175,712 D) $171,088

Find the original data from the stem–and–leaf plot.

13)

Stem	Leaves
8	5 8
9	1 8
10	5 5

A) 85, 88, 91, 98, 105, 105 B) 85, 88, 91, 91, 105, 105

C) 81, 85, 81, 98, 108, 105 D) 85, 81, 88, 91, 101, 105

14)

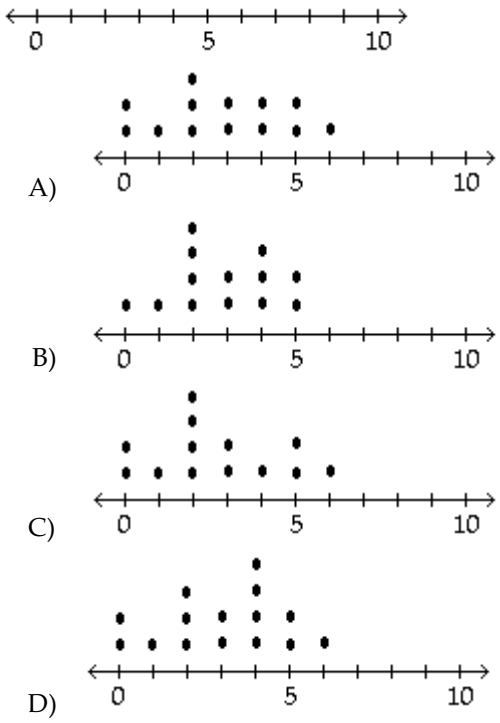
Stem	Leaves
73	2 5 8
74	2 3 9
75	1 8

A) 73258, 74239, 7518 B) 75, 78, 81, 76, 77, 83, 76, 83

C) 732, 735, 738, 742, 743, 749, 751, 758 D) 732, 735, 748, 742, 743, 749, 751, 768

Construct the dot plot for the given data.

15) A manufacturer records the number of errors each work station makes during the week. The data are as follows.
6 3 2 3 5 2 0 2 5 4 2 0 1



Use the data to create a stemplot.

16) The midterm test scores for the seventh-period typing class are listed below.
85 77 93 91 74 65 68 97 88 59 74 83 85 72 63 79

A)

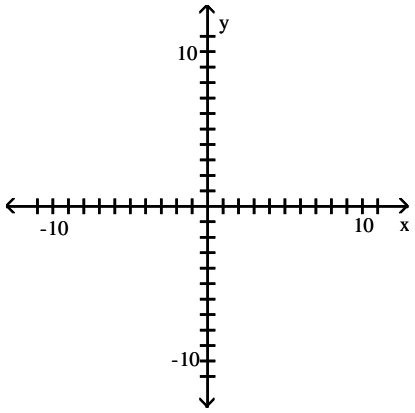
5	9
6	3 5 8
7	3 5 5 8
8	2 4 4 7 9
9	1 3 7

B)

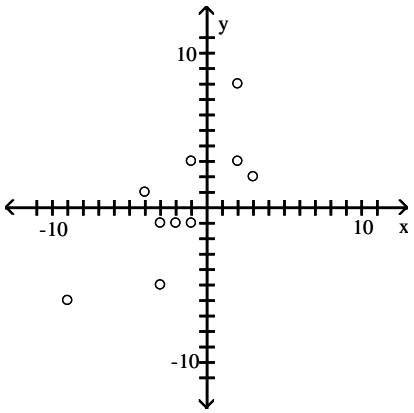
5	9
6	3 5 8
7	2 4 4 7 9
8	3 5 5 8
9	1 3 7

Use the given paired data to construct a scatterplot.

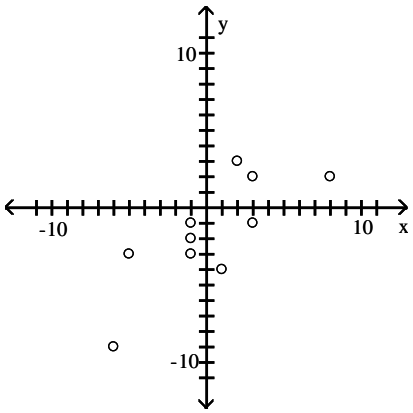
17) x 2 −1 −1 −6 3 3 1 8 −5 −1
y 3 −3 −1 −9 2 −1 −4 2 −3 −2



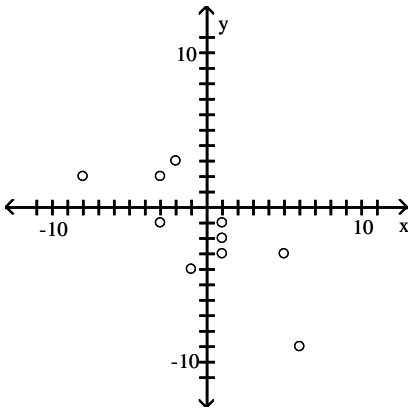
A)



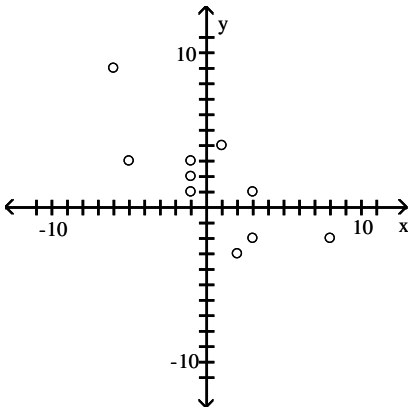
B)



C)



D)

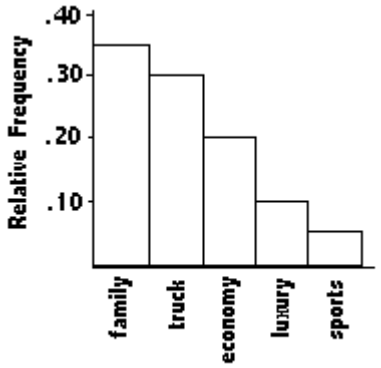


18) A car dealer is deciding what kinds of vehicles he should order from the factory. He looks at his sales report for the preceding period. Choose the vertical scale so that the relative frequencies are represented.

Vehicle	Sales
Economy	38
Sports	9.5
Family	66.5
Luxury	19
Truck	57

Construct a Pareto chart to help him decide.

A)



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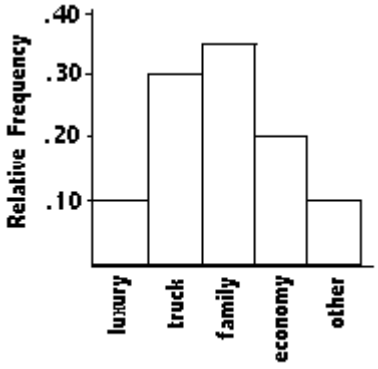

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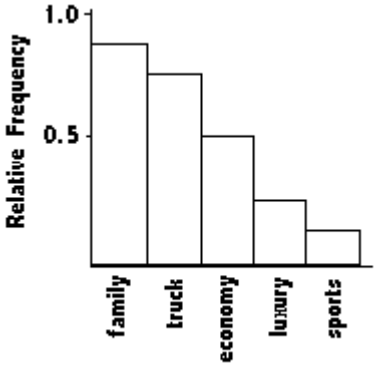
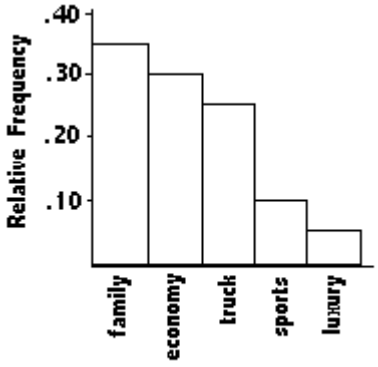


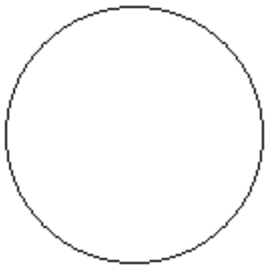
D)



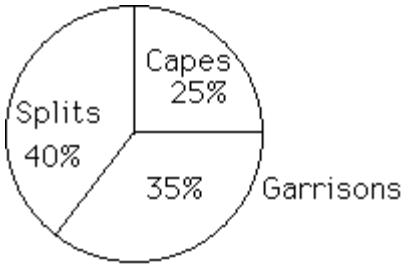
Construct a pie chart representing the given data set.

19) The following data give the distribution of the types of houses in a town containing 18,000 houses.

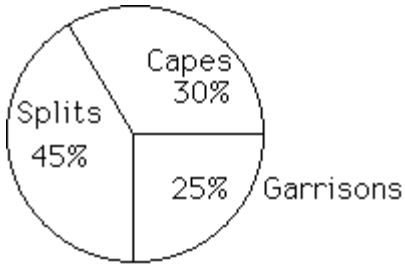
Capes	Garrisons	Splits
4500	6300	7200



A)



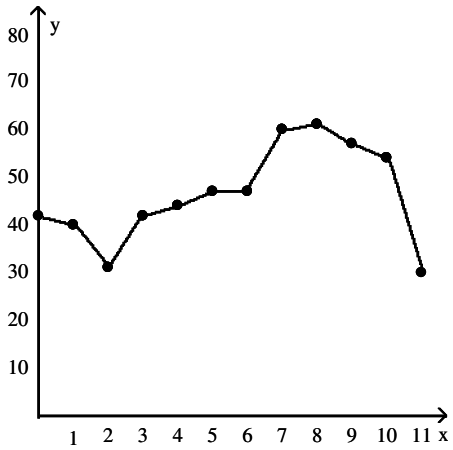
B)



Provide an appropriate response.

20) One purpose of displaying data graphically is to provide clues about trends. The given values are weights (ounces) of steaks listed on a restaurant menu as "20 ounce porterhouse" steaks. The weights are supposed to be 21 ounces because they supposedly lose an ounce when cooked. Create a frequency distribution with 5 classes. Based on your distribution, comment on the advertised "20 ounce" steaks.
17 20 21 18 20 20 20 18 19 19 20 19 21 20 18 20 20 19 18 19

1) Answers will vary. Possible answer: Histograms convey quantitative information about shapes of distributions . Pareto charts convey comparative information about relative standing of categorical data.
2) Since the range is 75 – 25 = 50, and 50 divided by 5 equals 10, a whole number, the class width has to be widened from 10 to 11. In that way, data values equal to 75 will not be omitted from the frequency table.
3) D
4) B
5) A
6)



Trend: Answers will vary. Possible answer: High closing stock values show a decrease from 1990 through 1992, after which the value of the stock rose through 1998. Another decrease occurred in 1999 and continued through 2001.

7) B
8) D
9) C
10) The areas of the bars for the two classes will actually be the same. This is because the bar for the class 60–69, while it is twice as tall as the bar for the class 70–89, is also only half the width because the class widths are not the same. Heights, not areas, are proportional to frequencies. For classes of equal width, areas will also be proportional to frequencies.
11) C
12) C
13) A
14) C
15) C
16) B
17) B
18) A
19) A
20) Answers will vary. Possible answer: The frequency distribution shows that half of the cooked steaks are less than their advertised weights.