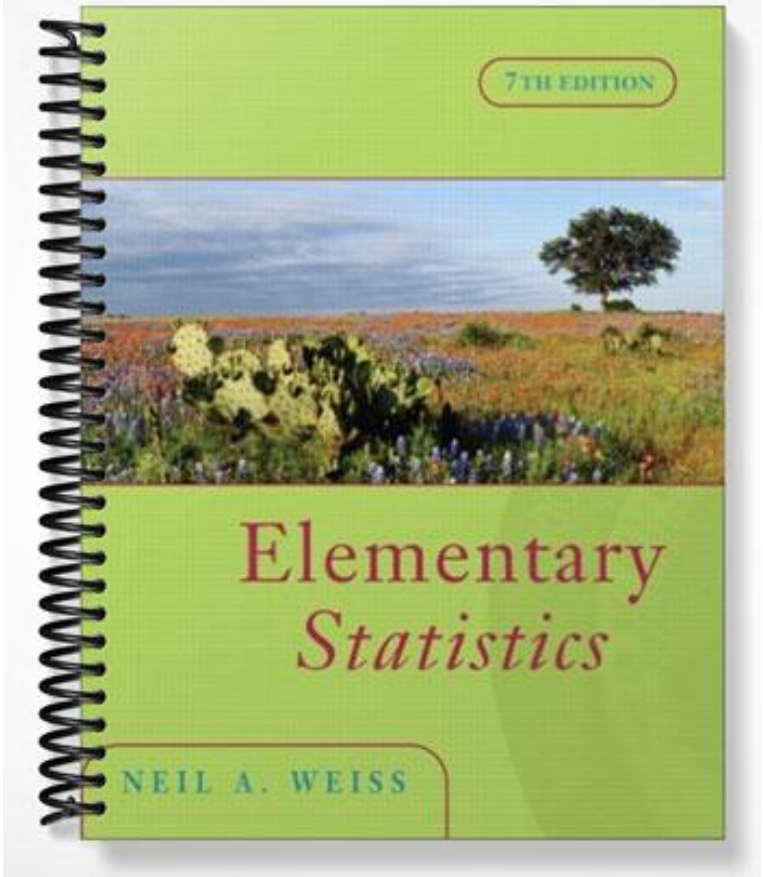
TEST BANK



# PRINTED TEST BANK

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# INTRODUCTORY STATISTICS
## EIGHTH EDITION
# ELEMENTARY STATISTICS
## SEVENTH EDITION

Neil A. Weiss
*Arizona State University*


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



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



ISBN-13: 978-0-321-43810-2
ISBN-10: 0-321-43810-8

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8TH EDITION
NEIL WEISS

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NEIL WEISS

Introductory Statistics (IS) / Elementary Statistics (ES): Chapter 1 Test Form A

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

**Provide an appropriate response.**

1) The table below shows the total number of births in the U.S. and the birth rate per 1,000 population in each of the years 1990–1994. 1) _____

| Year | Births | Birth Rate |
|---|---|---|
| 1990 | 4,158,512 | 16.7 |
| 1991 | 4,110,907 | 16.3 |
| 1992 | 4,065,014 | 15.9 |
| 1993 | 4,000,240 | 15.5 |
| 1994 | 3,979,000 | 15.3 |

Classify the study as either descriptive or inferential.

2) A researcher randomly selects a sample of 100 students from the students enrolled at a particular college. She asks each student his age and calculates the mean age of the 100 students. It is 21.3 years. Based on this sample, she then estimates the mean age of all students enrolled at the college to be 21.3 years. In what way are descriptive statistics involved in this example? In what way are inferential statistics involved? 2) _____

**Answer the question.**

3) A magazine publisher mails a survey to every subscriber asking about the quality of its subscription service. The total number of subscribers represents what? 3) _____

**Identify the study as an observational study or a designed experiment.**

4) An educational researcher used school records to determine that, in one school district, 84% of children living in two–parent homes graduated high school while 75% of children living in single–parent homes graduated high school. 4) _____

**Provide an appropriate response.**

5) Fill in the following blanks: The two major types of statistics are _____ statistics and _____ statistics. 5) _____

**List all possible samples from the specified population.**

6) Given a group of students: Allen (A), Brenda (B), Chad (C), Dorothy (D), and Eric (E), list all of the possible samples (without replacement) of size four that can be obtained from the group. 6) _____

**Provide an appropriate response.**

7) The finalists in an essay competition are Lisa (L), Melina (M), Ben (B), Danny (D), Eric (E), and Joan (J). Consider these finalists to be a population of interest. The possible samples (without replacement) of size three that can be obtained from this population of six finalists are as follows. 7) _____

L,M,B L,M,D L,M,E L,M,J L,B,D L,B,E
L,B,J L,D,E L,D,J L,E,J M,B,D M,B,E
M,B,J M,D,E M,D,J M,E,J B,D,E B,D,J
B,E,J D,E,J

If a simple random sampling method is used to obtain a sample of three of the finalists, what are the chances of selecting Ben, Danny, and Joan?

**Use the random number table in Appendix A to obtain the required list of random numbers.**

8) A medical researcher is conducting clinical trials. Of the 60 people participating in the trial, 20 will receive a placebo, 20 will receive the experimental drug, and 20 will constitute the control group. The 20 people who will receive the drug will be selected at random. Construct a list of 20 random numbers between 1 and 60 which can be used in obtaining the required simple random sample. Use the random number table and use as your starting point the digits 54 in row 15, columns 20–21. 8) _____

**Provide an appropriate response.**

9) A political researcher wishes to gauge political sentiment regarding a proposed tax cut. He obtains a list of 1000 email addresses from an internet provider, uses a random number table to select a random sample of 100 of these addresses, emails the people in the sample and requests that they respond to his questions by email. Do you think that the group of people who respond is likely to be representative of all registered voters? Explain your answer. 9) _____

10) At a college there are 120 freshmen, 90 sophomores, 110 juniors, and 80 seniors. A school administrator selects a simple random sample of 12 of the freshmen, a simple random sample of 9 of the sophomores, a simple random sample of 11 of the juniors, and a simple random sample of 8 of the seniors. She then interviews all the students selected. Identify the type of sampling used in this example. 10) _____

11) Describe the advantages and disadvantages of cluster sampling as compared with simple random sampling. 11) _____

**A designed experiment is described. Identify the specified element of the experiment.**

12) In a clinical trial, 780 participants suffering from high blood pressure were randomly assigned to one of three groups. Over a one–month period, the first group received a low dosage of an experimental drug, the second group received a high dosage of the drug, and the third group received a placebo. The diastolic blood pressure of each participant was measured at the beginning and at the end of the period and the change in blood pressure was recorded. Identify the experimental units (subjects). 12) _____

13) An education researcher was interested in examining the effect of the teaching method and the effect of the particular teacher on students' scores on a reading test. In a study, there are two different teachers (Juliana and Felix) and three different teaching methods (method A, method B, and method C). The number of students participating in the study is 258. Students are randomly assigned to a teaching method and teacher. Identify the treatments. 13) _____

**Provide an appropriate response.**

14) A college lecturer has devised a new method of teaching a particular mathematical concept and wishes to try out this teaching method on a representative sample of his students. There are 76 students in his class and he wishes to obtain a simple random sample of 25 of them. Describe a method which would be unlikely to yield a representative sample. 14) _____

15) In a clinical trial, each participant will receive a placebo, a low dosage of a drug, or a high dosage of the drug. The participants consist of 90 men and 90 women. The 90 men are randomly divided into three groups of 30 men each. Each group of men is randomly assigned to a different treatment (placebo, low dose, or high dose). Likewise, the 90 women are randomly divided into three groups of 30 women each. Each group of women is randomly assigned to a different treatment (placebo, low dose, or high dose). Is this a completely randomized design or a randomized block design? Explain your answer. 15) _____

1) Descriptive
2) When calculating the mean age of the students in the sample, the researcher is using descriptive statistics. When estimating the mean age of all students at the college, the researcher is using inferential statistics.
3) The population
4) Observational study
5) descriptive and inferential
6) A,B,C,D  A,B,C,E  A,C,D,E  A,D,E,B  B,C,D,E
7) $\frac{1}{20}$
8) 54, 2, 3, 41, 24, 19, 8, 30, 4, 6, 36, 15, 14, 40, 1, 5, 39, 42, 58, 10
9) No; explanations will vary. Possible answer: the sample was obtained from among people who own a computer. That group is likely to include relatively wealthy people who are more likely to favor a tax cut. Furthermore, the group includes those who chose voluntarily to respond. People who respond voluntarily are likely to have stronger opinions than the average voter.
10) Stratified sampling
11) Answers will vary. Possible answer: Cluster sampling can save time when members of the population are widely scattered geographically. The disadvantage is that members of a cluster may be more homogeneous than the members of the population as a whole and may not mirror the entire population.
12) The participants in the experiment
13) Juliana and method A, Juliana and method B, Juliana and method C, Felix and method A, Felix and method B, Felix and method C
14) Answers will vary. Possible answer: The lecturer stands at the door of his classroom and tells the first 25 students to arrive to class that they are invited to a special bonus session of class to be held at some upcoming date. This is unlikely to yield a representative sample as the students who show up to class first could possibly be the ones who are more conscientious and hard–working. Or, the students may refuse to volunteer for an extra class period, so the lecturer's sample would be too small to be a representative sample.
15) This is a randomized block design. Explanations will vary.

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

**Provide an appropriate response.**

1) The table below shows the number of homicides in the U.S. in each of the years 1989–1993. 1) _____

| Year | Murder and non–negligent manslaughter Number of offenses |
|---|---|
| 1989 | 21,500 |
| 1990 | 23,440 |
| 1991 | 24,700 |
| 1992 | 23,760 |
| 1993 | 24,530 |

Classify the study as either descriptive or inferential.

2) A statistics student's presentation of the results of her study included many charts, graphs, and tables. Identify the kind of statistical study conducted. 2) _____

**Answer the question.**

3) An employee at the local ice cream parlor asks three customers if they like chocolate ice cream. Identify the sample and population. 3) _____

**Identify the study as an observational study or a designed experiment.**

4) At one hospital in 1992, 674 women were diagnosed with breast cancer. Five years later, 88% of the Caucasian women and 83% of the African American women were still alive. 4) _____

**Provide an appropriate response.**

5) At one hospital in 1992, 674 women were diagnosed with breast cancer. Five years later, 88% of the Caucasian women and 63% of the African American women were still alive. This observational study shows an association between race and breast cancer survival--that Caucasian women are more likely to survive breast cancer than African American women. How could this study be modified to make it a designed experiment? Comment on the feasibility of the designed experiment that you described. 5) _____

**List all possible samples from the specified population.**

6) The finalists in an essay competition are Lisa (L), Melina (M), Ben (B), Danny (D), Eric (E), and Joan (J). Consider these finalists to be a population of interest. List the 20 possible samples (without replacement) of size three from this population of six finalists. 6) _____

**Provide an appropriate response.**

7) True or false? In simple random sampling, each possible sample is equally likely to be the one obtained. 7) _____

8) The members of a board of directors have the following roles: president (P), vice president (V), secretary (S), treasury (T), and fundraiser (F). Consider these board members to be a population of interest. The possible samples (without replacement) of size two that can be obtained from these five board members are as follows. 8) _____

P,V P,S P,T P,F V,S V,T V,F S,T S,F T,F

If a simple random sampling method is used to obtain a sample of two of the board members, what are the chances of selecting the secretary and the treasurer?

**Use the random number table in Appendix A to obtain the required list of random numbers.**

9) A company employs 5382 people and wishes to interview a random sample of 14 of them with regard to the company's health insurance policy. Construct a list of 14 random numbers between 1 and 5382 that can be used in obtaining the required simple random sample. Use the random number table and use as your starting point the digits 0691 in row 3, columns 30–33. 9) _____

**Provide an appropriate response.**

10) A political researcher wishes to gauge political sentiment regarding a proposed tax cut. He obtains a list of 1000 email addresses from an internet provider, uses a random number table to select a random sample of 100 of these addresses, emails the people in the sample and requests that they respond to his questions by email. Do you think that the group of people who respond is likely to be representative of all registered voters? Explain your answer. 10) _____

11) From a group of 496 students, every 49th student starting with the 3rd student is selected. Identify the type of sampling used in this example. 11) _____

12) Which method of sampling is easier: simple random sampling or systematic random sampling? 12) _____

**A designed experiment is described. Identify the specified element of the experiment.**

13) In a clinical trial, 780 participants suffering from high blood pressure were randomly assigned to one of three groups. Over a one–month period, the first group received a low dosage of an experimental drug, the second group received a high dosage of the drug, and the third group received a placebo. The diastolic blood pressure of each participant was measured at the beginning and at the end of the period and the change in blood pressure was recorded. Identify the factor. 13) _____

14) An education researcher was interested in examining the effect of the teaching method and the effect of the particular teacher on students' scores on a reading test. In a study, there are four different teachers (Juliana, Felix, Sonia, and Helen) and three different teaching methods (method A, method B, and method C). The number of students participating in the study is 258. Students are randomly assigned to a teaching method and teacher. Identify the experimental units (subjects). 14) _____

**Provide an appropriate response.**

15) Give an example of a designed experiment. In your experiment, identify the experimental units, the response variable, the factor(s), the levels of each factor, and the treatments. 15) _____

1) Descriptive
2) The purpose of the study may have been completely descriptive or it might have been inferential.
3) Sample: the 3 selected customers; population: all customers
4) Observational study
5) To make the study a designed experiment, a researcher could start with a randomly chosen group of women who had been diagnosed with breast cancer in 1992. The women would then be divided into two groups: Caucasian women and African American women. The two groups of women would be required to receive the exact same cancer treatment over the next five years; then the survival rates would be recorded. This designed experiment may be infeasible because some of the women may not wish to receive the treatment provided versus a treatment that could be more appropriate to their case (radiation, chemotherapy, surgery) or any cancer treatment whatsoever. Controlling the treatment method may not be sufficient to establish whether there is a causation between race and survival rate. Other factors may affect the survival statistics, such as economic status, age, other health factors, etc.
6) L,M,B L,M,D L,M,E L,M,J L,B,D L,B,E L,B,J L,D,E L,D,J L,E,J
   M,B,D M,B,E M,B,J M,D,E M,D,J M,E,J B,D,E B,D,J B,E,J D,E,J
7) True
8) $\frac{1}{10}$
9) 691, 3863, 3034, 978, 4584, 99, 362, 245, 1788, 4947, 471, 1562, 684, 2598
10) No; explanations will vary. Possible answer: the sample was obtained from among people who own a computer. That group is likely to include relatively wealthy people who are more likely to favor a tax cut. Furthermore, the group includes those who chose voluntarily to respond. People who respond voluntarily are likely to have stronger opinions than the average voter.
11) Systematic random sampling
12) Systematic random sampling
13) The experimental drug
14) The 258 students participating in the study
15) Answers will vary.

Introductory Statistics (IS) / Elementary Statistics (ES): Chapter 1 Test Form C

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

**Provide an appropriate response.**

1) Thirty of the 198 students enrolled in Statistics 101 were asked if they wanted Exam II to be a take–home or an in–class assessment. Twenty, or about 67%, of the students polled indicated a preference for an in–class exam. The professor concluded that the majority of students in Statistics 101 would prefer an in–class examination for the second assessment. Did the professor perform a descriptive study or an inferential study? 1) _____

2) A news article appearing in a national paper stated that "The fatality rate from use of firearms sank to a record low last year, the government estimated Friday. But the overall number of violent fatalities increased slightly, leading the government to urge an increase in police forces in major urban areas. Overall, 15,600 people died from violent crimes in 2005, up from 15,562 in 2004, according to projections from a government source. Is the figure15,600 a descriptive statistic or an inferential statistic? Is the figure 15,562 a descriptive statistic or an inferential statistic? 2) _____

**Answer the question.**

3) A magazine publisher mails a survey to every subscriber asking about the timeliness of its subscription service. The publisher finds that only 4% of the subscribers responded. This 4% represents what? 3) _____

**Identify the study as an observational study or a designed experiment.**

4) In a clinical trial, 780 participants suffering from high blood pressure were randomly assigned to one of three groups. Over a one–month period, the first group received the experimental drug, the second group received a placebo, and the third group received no treatment. The diastolic blood pressure of each participant was measured at the beginning and at the end of the period and the change in blood pressure was recorded. The average change in blood pressure was calculated for each of the three groups and the three averages were compared. 4) _____

**Provide an appropriate response.**

5) Define the terms population and sample. 5) _____

**List all possible samples from the specified population.**

6) The six members of a board of directors are Sam (S), Laurie (L), Peggy (P), Jorges (J), Max (M), and Claude (C). Consider these board members to be a population of interest. List the 15 possible samples (without replacement) of size four from this population of six board members. 6) _____

**Provide an appropriate response.**

7) Define simple random sampling. Explain why this is important in design of experiments. 7) _____

8) The finalists in an essay competition are Lisa (L), Melina (M), Ben (B), Danny (D), Eric (E), and Joan (J). Consider these finalists to be a population of interest. The possible samples (without replacement) of size two that can be obtained from this population of six finalists are as follows. 8) _____

L,M L,B L,D L,E L,J M,B M,D
M,E M,J B,D B,E B,J D,E D,J E,J

If a simple random sampling method is used to obtain a sample of two of the finalists, what are the chances of selecting Lisa and Danny?

**Use the random number table in Appendix A to obtain the required list of random numbers.**

9) A market researcher is conducting a telephone poll. She has a list of 581 registered voters and wishes to interview a random sample of 12 of them. Construct a list of 12 random numbers between 1 and 581 that can be used in obtaining the required simple random sample. Use the random number table and use as your starting point the digits 432 in row 13, columns 10–12. 9) _____

**Provide an appropriate response.**

10) Before premiering a blockbuster movie at a theater, test screenings are done beforehand. A small number of selected theaters are chosen geographically throughout the country. Each theater chosen is supposed to be representative of theatergoers in that area. Everyone is interviewed when the movie is over. Identify the type of sampling used in this example. 10) _____

11) Define the terms "stratified sampling", "systematic sampling" and "cluster sampling". Give examples for each. 11) _____

**A designed experiment is described. Identify the specified element of the experiment.**

12) In a clinical trial, 780 participants suffering from high blood pressure were randomly assigned to one of three groups. Over a one–month period, the first group received a low dosage of an experimental drug, the second group received a high dosage of the drug, and the third group received a placebo. The diastolic blood pressure of each participant was measured at the beginning and at the end of the period and the change in blood pressure was recorded. Identify the response variable. 12) _____

13) An education researcher was interested in examining the effect of the teaching method and the effect of the particular teacher on students' scores on a reading test. In a study, there are four different teachers (Juliana, Felix, Sonia, and Helen) and three different teaching methods (method A, method B, and method C). The number of students participating in the study is 258. Students are randomly assigned to a teaching method and teacher. Identify the experimental units (subjects). 13) _____

**Provide an appropriate response.**

14) An agricultural researcher wishes to compare the yield of four different varieties of wheat. 64 plots of land are available for an experiment. On each plot of land one of the varieties of wheat will be grown. At the end of the experiment the yield for the different varieties will be compared. 32 of the plots are at one site (site A) and the other 32 are at another site (site B). The soil at site A differs significantly from the soil at site B. The researcher wishes to design an experiment. In this example, why might a randomized block design, with blocking by soil type, be preferable to a completely randomized design? 14) _____

15) A store manager wishes to determine whether his customers would be prepared to pay a little extra for organic produce. He uses a random number table to choose 50 random numbers between 1 and 200. He stands outside the store on a Monday morning between 9:00 a.m. and 12:00 noon and interviews the people corresponding to the random numbers. For example random number 82 would correspond to the 82nd person to arrive. Do you think that the sample obtained in this way will be representative of all the store's customers? 15) _____

1) Descriptive
2) The figure15,600 is an inferential statistic since it is indicated in the statement that it is a projection (probably based on incomplete data for the year 2005). The figure 15,562 is a descriptive statistic since it reflects the actual number of deaths from violent crimes for the year 2004.
3) The sample
4) Designed experiment
5) A population is the complete collection of all individuals or items under consideration in a statistical study. A sample is that part of the population from which information is obtained.
6) S,L,P,J S,L,P,M S,L,P,C S,L,J,M S,L,J,C S,L,M,C S,P,J,M S,P,J,C
   S,P,M,C S,J,M,C L,P,J,M L,P,J,C L,P,M,C L,J,M,C P,J,M,C
7) In simple 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.
8) $\frac{1}{15}$
9) 432, 452, 534, 16, 343, 242, 428, 378, 163, 182, 293, 422
10) Cluster sampling
11) Stratified sampling subdivides the population into at least two different subpopulations (strata) and then draws a simple random sample from each stratum.

    Systematic sampling divides the population size by the sample size and rounds the result down to the nearest whole number, m. Then, using a random–number table to obtain a number k between 1 and m, selects for the sample those members numbered k, k + m, k + 2m, and so on.

    In cluster sampling, the population is divided into sections, then sections are randomly selected, and then all members of the randomly selected sections are surveyed. Examples will
12) Change in diastolic blood pressure
13) The 258 students participating in the study
14) Answers will vary. Possible answer: by blocking, the researcher can isolate and remove the variation in yield which is due to different soil types. It will then be easier to detect the differences in yield among the four varieties of wheat, if such differences exist.
15) No; explanations will vary. Possible answer: the sample was obtained from among people shopping on a Monday morning. That group is likely to include a relatively large number of people who do no have full time jobs and a relatively large number of parents. This group may tend to have different views than the entire population of customers. People with young children, for example, may be more concerned than most about the health effects of produce grown with pesticides.

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

**Classify the data as either qualitative or quantitative.**

1) The following table gives the top five movies at the box office this week. 1) _____

| Rank | Last week | Movie title | Studio | Box office sale |
|---|---|---|---|---|
| 1 | N/A | Pirate Adventure | Movie Giant | 35.2 |
| 2 | 2 | Secret Agent Files | G.M.G. | 19.5 |
| 3 | 1 | Epic Super Hero Team | 21st Century | 14.3 |
| 4 | 5 | Reptile Ride | Movie Giant | 10.1 |
| 5 | 4 | Must Love Cats | Dreamboat | 9.9 |

What kind of data is provided by the information in the fourth column?

**Classify the data as either discrete or continuous.**

2) What type of data is provided by the statement "Helen finished in 10th place in the ice dancing competition"? 2) _____

**Identify the variable.**

3) The following table gives the top five movies at the box office this week. 3) _____

| Rank | Last week | Movie title | Studio | Box office sale |
|---|---|---|---|---|
| 1 | N/A | Pirate Adventure | Movie Giant | 35.2 |
| 2 | 2 | Secret Agent Files | G.M.G. | 19.5 |
| 3 | 1 | Epic Super Hero Team | 21st Century | 14.3 |
| 4 | 5 | Reptile Ride | Movie Giant | 10.1 |
| 5 | 4 | Must Love Cats | Dreamboat | 9.9 |

Identify the variable under consideration in the first column?

**Tell whether the statement is true or false.**

4) A discrete variable always yields numerical values. 4) _____

**Construct a grouped–data table for the given data. Use the symbol $\lessdot$ to mean "up to, but not including".**

5) On a math test, the scores of 24 students were 5) _____

92 77 77 68 77 77 92 82 77 65 83 77
77 83 77 77 83 77 77 82 77 83 82 68

Construct a frequency table. Use 4 classes beginning with a lower class limit of 60.

| Score | Frequency |
|---|---|
| | |

**Provide the requested table entry.**

6) The data in the following table reflect the amount of time 40 students in a section of Statistics 101 spend on homework each day. Determine the value that should be entered in the relative frequency column for the class 45–59. 6) _____

| Homework time (minutes) | Number of students | Relative frequency |
|---|---|---|
| 0–14 | 2 | |
| 15–29 | 4 | |
| 30–44 | 10 | |
| 45–59 | 16 | |
| 60–74 | 6 | |
| 75–89 | 2 | |

**Complete the contingency table and use it to solve the problem.**

7) The partially filled contingency table gives the frequencies of the data on age (in years) and sex from the residents of a retirement home. 7) _____

| | Age (yrs) | | |
|---|---|---|---|
| | 60–69 | 70–79 | Over 79 |
| Male | 9 | 4 | 5 |
| Female | 11 | 7 | 4 |
| Total | | | |

What is the relative frequency for males ?

**Provide an appropriate response.**

8) Maria constructed the grouped-data table shown below. The data represent the heights of 60 randomly selected women. 8) _____

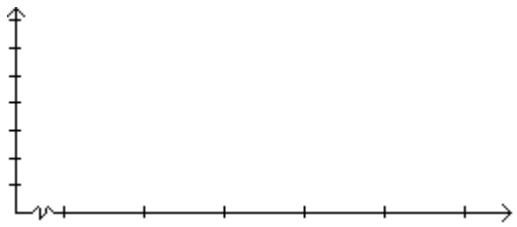
| Height | Frequency |
|---|---|
| $54 \leq 60$ | 7 |
| $60 \leq 61$ | 1 |
| $61 \leq 62$ | 3 |
| $62 \leq 63$ | 5 |
| $63 \leq 64$ | 7 |
| $64 \leq 65$ | 7 |
| $65 \leq 66$ | 6 |
| $66 \leq 72$ | 24 |

She concluded from her grouped-data table that the heights 66, 67, 68, 69, 70, and 71 inches are the most common for women. What is wrong with her conclusion? How is her grouped-data table misleading and how could the table be improved?

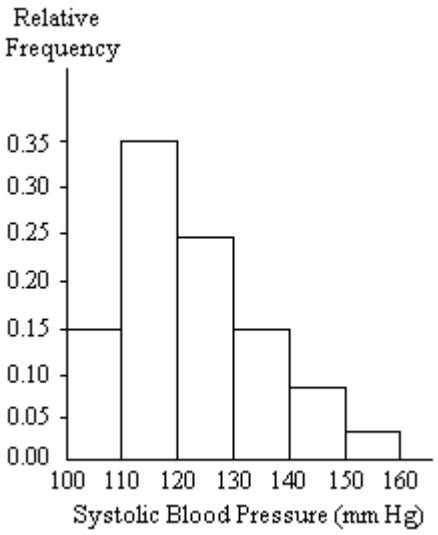
**Construct the specified histogram.**

9) In a survey, 20 voters were asked their age. The results are summarized in the frequency table below. Construct a frequency histogram corresponding to the frequency table. 9) _____

| Age of voters | Number of voters |
|---|---|
| $20 \leq 30$ | 5 |
| $30 \leq 40$ | 5 |
| $40 \leq 50$ | 6 |
| $50 \leq 60$ | 0 |
| $60 \leq 70$ | 4 |



**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.**




10) Approximately what percentage of the people aged 25–40 had a systolic blood pressure reading less than 120? 10) _____

**Construct a stem–and–leaf diagram for the given data.**

11) The weights of 22 members of the varsity football team are listed below. 11) _____

144 152 142 151 160 152 131 164 141 153 140
144 175 156 147 133 172 159 135 159 148 171

**Provide an appropriate response.**

12) Shortly before an election, a market research firm took a poll to find out whether people were planning to vote for or against a particular ballot measure. The results are shown below. 12) _____

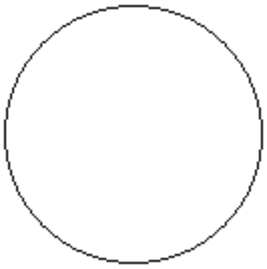
| Position | Frequency |
|---|---|
| Against | 3087 |
| In favor | 3691 |
| Undecided | 910 |

The ballot measure will pass if a simple majority (more than 50%) vote in favor of the measure. You wish to construct a graph to represent the data. It should be easy to see from your graph whether more than 50% of the people are planning to vote in favor of the measure. Which graph would be more useful, a bar graph or a pie chart? Explain your thinking.

**Construct a pie chart representing the given data set.**

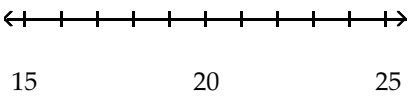
13) The following data give the distribution of the types of houses in a town containing 22,000 houses. 13) _____

| House Type | Frequency | Relative Frequency |
|---|---|---|
| Cape | 5500 | 0.25 |
| Garrison | 8800 | 0.35 |
| Split | 7700 | 0.40 |



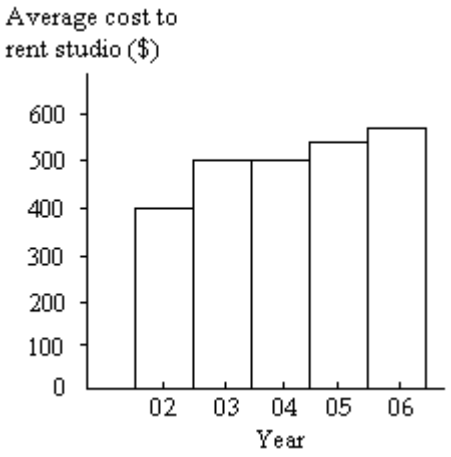
**Construct a dotplot for the given data.**

14) The following data represent the number of cars passing through a toll booth during a certain time period over a number of days.
18 19 17 17 24 18 21 18 19 15 22 19 23 17 21 14) _____



**Provide an appropriate response.**

15) The bar graph below shows the average cost of renting a studio in one city in each of the years 2002 through 2006. 15) _____

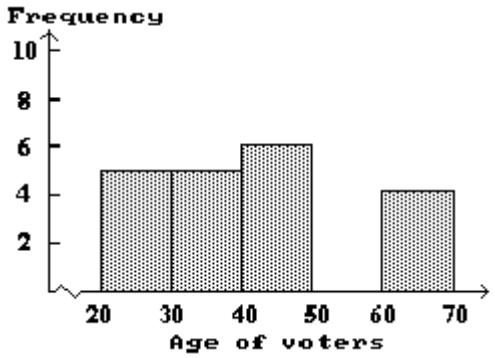



By what percentage does the average price increase from 2002 to 2003? Obtain a truncated version of the graph by sliding a piece of paper over the bottom of the graph so that the bars start at 300. In the truncated graph, by what percentage does the price appear to increase from 2002 to 2003? Why is the truncated graph misleading?

1) Qualitative
2) Discrete
3) rank this week
4) True
5)

| Score | Frequency |
|---|---|
| $60 \leq 70$ | 3 |
| $70 \leq 80$ | 12 |
| $80 \leq 90$ | 7 |
| $90 \leq 100$ | 2 |

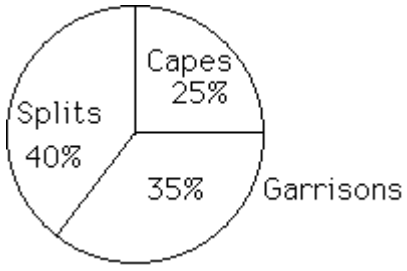
6) 0.4
7) $\frac{9}{20}$
8) Answers will vary. Possible answer: The classes do not have equal width, so it is not meaningful to compare the frequencies for the different classes. The class $66 \leq 72$ has the highest frequency because this class includes a larger range of heights than the other classes. The table should be set up with equal–width classes. (Although there may be one open–ended class).
9)



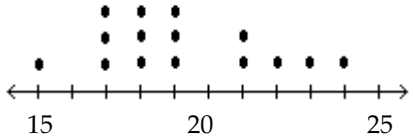

10) 50%
11)

| | |
|---|---|
| 13 | 1 3 5 |
| 14 | 4 2 1 4 7 8 0 |
| 15 | 2 1 2 3 6 9 9 |
| 16 | 0 4 |
| 17 | 5 2 1 |

12) Answers will vary. Possible answer: A pie chart would be more useful. A pie chart is useful for comparing the size of each category with the *whole* (ie the proportion of the whole population falling in each category). A bar graph is more useful for comparing the sizes of different categories with each other.
13)



14)




15) Answers will vary. Possible answer: The average price increases by 25% from 2002 to 2003. Using the truncated graph, the price appears to double from 1994 to 1995 (i.e. it appears to increase by 100%). Using the truncated graph, the differences between the bars seem bigger (relatively) than they really are.

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

**Classify the data as either qualitative or quantitative.**

1) The following table gives the top five movies at the box office this week. 1) _____

| Rank | Last week | Movie title | Studio | Box office sale |
|---|---|---|---|---|
| 1 | N/A | Pirate Adventure | Movie Giant | 35.2 |
| 2 | 2 | Secret Agent Files | G.M.G. | 19.5 |
| 3 | 1 | Epic Super Hero Team | 21st Century | 14.3 |
| 4 | 5 | Reptile Ride | Movie Giant | 10.1 |
| 5 | 4 | Must Love Cats | Dreamboat | 9.9 |

What kind of data is provided by the information in the first column?

**Classify the data as either discrete or continuous.**

2) The number of freshmen entering college in a certain year is 621. 2) _____

**Identify the variable.**

3) For the year 2006 , a large record company reported the following sales figures for various music media. 3) _____

| Media | Sales ($ millions) |
|---|---|
| CD | 1477.3 |
| CD single | 1.8 |
| MP3 | 65.9 |
| Vinyl | 2.6 |
| Music video | 531.4 |
| Mini Disc | 0.3 |
| DVD | 108.2 |
| Cassette | 3.4 |

Identify the variable under consideration in the first column?

**Tell whether the statement is true or false.**

4) A variable whose values are observed by counting something must be a discrete variable. 4) _____

**Construct a grouped–data table for the given data. Use the symbol $\leqslant$ to mean "up to, but not including".**

5) The table shows the closing share price, in dollars, for each of the 32 stock holdings of a mutual fund. 5) _____

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $18\frac{1}{16}$ | $24\frac{5}{8}$ | $56\frac{3}{4}$ | 48 | $14\frac{9}{16}$ | $53\frac{3}{8}$ | $25\frac{1}{4}$ | $20\frac{1}{4}$ |
| 20 | $27\frac{11}{16}$ | $67\frac{3}{16}$ | $30\frac{1}{2}$ | $18\frac{1}{8}$ | 62 | $31\frac{9}{16}$ | $47\frac{3}{8}$ |
| $52\frac{15}{16}$ | $29\frac{5}{8}$ | 26 | $13\frac{15}{16}$ | $11\frac{11}{16}$ | $24\frac{7}{8}$ | $49\frac{3}{4}$ | 70 |
| $45\frac{1}{16}$ | $54\frac{1}{2}$ | $56\frac{3}{16}$ | 60 | $58\frac{15}{16}$ | $37\frac{5}{8}$ | $59\frac{3}{4}$ | 51 |

Construct a grouped–data table for these share prices. Use 10 as the first cutpoint and classes of equal width 10.

| Share price | |
|---|---|
| | |

**Provide the requested table entry.**

6) The data in the following table represent heights of students at a highschool. Find the value of the missing entry. 6) _____

| Height (centimeters) | Relative frequency |
|---|---|
| $142 \leqslant 152$ | 0.03 |
| $152 \leqslant 162$ | 0.21 |
| $162 \leqslant 172$ | 0.27 |
| $172 \leqslant 182$ | 0.28 |
| $182 \leqslant 192$ | |
| $192 \leqslant 202$ | 0.02 |

**Complete the contingency table and use it to solve the problem.**

7) The partially filled contingency table gives the relative frequencies of the data on age (in years) and sex from the residents of a retirement home. 7) _____

| | Age (yrs) | | | |
|---|---|---|---|---|
| | 60–69 | 70–79 | Over 79 | Tot |
| ale | 0.24 | 0.1 | 0.06 | |
| nale | 0.2 | 0.1 | 0.3 | |
| otal | | | | 1 |

What percentage of residents are males in the age group 60–79?

**Provide an appropriate response.**

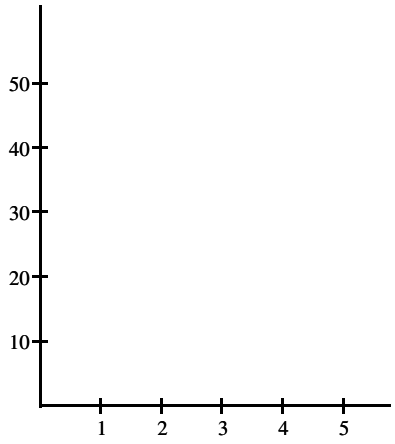
8) Suppose you are comparing frequency data for two different groups, 25 managers and 150 blue collar workers. Why would a relative frequency distribution be better than a frequency distribution? 8) _____

**Construct the requested histogram.**

9) The table gives the frequency distribution for the data involving the number of radios per household for a sample of 80 U.S. households. 9) _____

| # of Radios | Frequency |
|---|---|
| 1 | 5 |
| 2 | 10 |
| 3 | 30 |
| 4 | 25 |
| 5 | 10 |

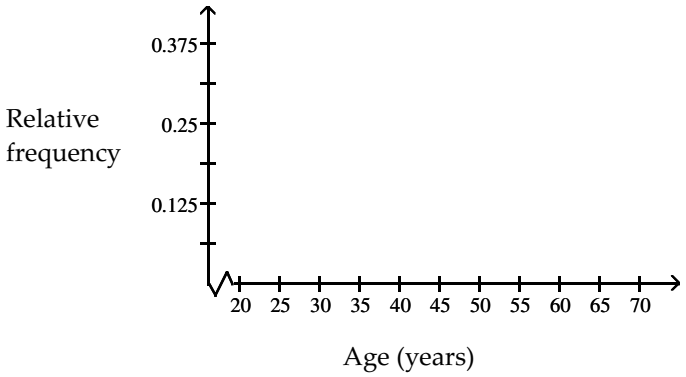
Construct a frequency histogram.



**Construct a relative–frequency polygon for the given data.**

10) The table contains the frequency and relative–frequency distributions for the ages of the employees in a particular company department. 10) _____

| Age (years) | Frequency | Relative frequency |
|---|---|---|
| $20 \leq 30$ | 6 | 0.375 |
| $30 \leq 40$ | 3 | 0.1875 |
| $40 \leq 50$ | 4 | 0.25 |
| $50 \leq 60$ | 2 | 0.125 |
| $60 \leq 70$ | 1 | 0.0625 |




**Construct a stem–and–leaf diagram for the given data.**

11) The midterm test scores for the seventh–period typing class are listed below. 11) _____

85 77 93 91 74 65 68 97 88 59 74 83 85 72 63 79

**Provide an appropriate response.**

12) Which type of graph, a stem–and–leaf diagram or a frequency histogram, would be more useful for the data set below? Explain your thinking. 12) _____

2.3 3.2 5.1 6.3 7.3 7.7 8.1 8.9 9.3
9.5 10.2 11.1 12.7 14.7 15.6 16.4 18.6 19.1