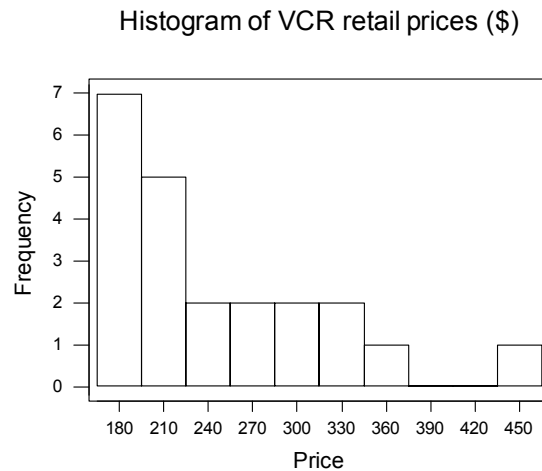


The following multiple choice questions are worth 5 points each.



1. Use the above histogram to find the approximate percentage of VCR retail prices that fall between \$240 and \$360.
  - a. 14 %
  - b. 41 %
  - c. 50 %
  - d. 17 %
  
2. A survey in *Newsweek* (Nov. 14, 1194, p.54) asked “Does the Senate generally pay too much attention to the personal lives of people nominated to high office, or not enough? Fifty-six percent of the respondents said, “too much attention.” It was also reported that “for this Newsweek poll, Princeton Survey Research Associates telephoned 756 adults Nov. 3-4, and the margin of error is +/- 4 percentage points. Which of the following statements are **true**?
  - I. The margin of error tells us that the proportion of the population with this opinion is almost certainly within 4% of the sample proportion of 56%.
  - II. The margin of error tells us that the proportion of the population with this opinion is greater than 50%.
  - III. The margin of error tells us that between 752 and 760 adults hold this opinion.
  - a. I, II
  - b. I, III
  - c. II, III
  - d. I, II, III

3. A polling company surveyed 200 people outside a county courthouse concerning tighter restrictions on smoking in public buildings. Their results indicate that 34% of those surveyed favor tighter restrictions. The actual proportion of county residents who favor tighter restrictions is 65%. The difference is most likely due to
- variability in sampling.
  - bias due to the use of a convenience sample.
  - confounding variables in the survey.
  - the wording of the survey.
4. Which of the following is/are true?
- Bias is a systematic error that tends to favor certain outcomes.
  - Statistically significant means that the result of an experiment is larger than previously thought possible.
  - An observational study is an experiment where different treatments are given to two groups to compare their responses.
- I, II, and III are all true.
  - I and III only are true.
  - I only is true.
  - II only is true.
  - III only is true.
5. In order to determine the mean weight of bags of chips filled by its packing machines, a company inspects 50 bags per day and weighs them. In this example, the population is
- the 50 bags inspected each day.
  - all potato chips produced by the company.
  - all bags of chips produced by the company.
  - the weight of the 50 bags inspected.
6. In a study relating two variables, Y and X, the regression equation is  $y = 3.4x + 2.1$ , and the correlation coefficient  $r = 0.2$ . Which of the following is most likely?
- There is a cause and effect relationship between Y and X.
  - Y and X are both related to a third variable, Z.
  - The regression equation will not be a very good predictor of Y.
  - None of the above.

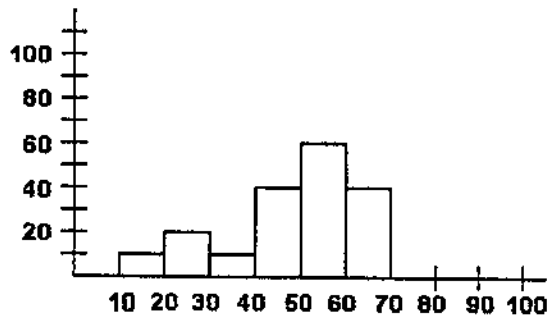
Use the following random digits to answer the following question:

|     |       |       |       |       |       |       |       |
|-----|-------|-------|-------|-------|-------|-------|-------|
| 104 | 08900 | 87788 | 73717 | 19287 | 69954 | 45917 | 80026 |
| 105 | 75029 | 51052 | 25648 | 02523 | 84300 | 83093 | 39852 |
| 106 | 91276 | 88988 | 12439 | 73741 | 30492 | 19280 | 41255 |
| 107 | 74008 | 72750 | 70742 | 67769 | 72837 | 27098 | 07049 |

7. A large group of people are eating dinner at a Chinese restaurant. They are very hungry. The menus are printed in Chinese but no one in the group can read Chinese. Use the portion of the random digits table above, starting at line 105 to choose 5 dishes from the menu numbered 01 to 50.

- a. 2, 5, 7, 9, 10  
 b. 02, 10, 23, 25, 25  
 c. 02, 10, 23, 25, 30  
 d. 02, 05, 09, 25, 30

8. Given the histogram below, which statement is true?

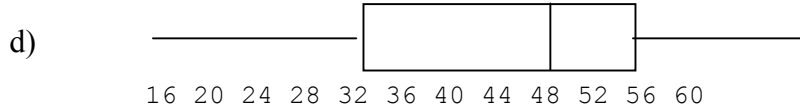
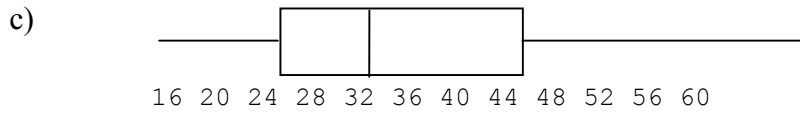
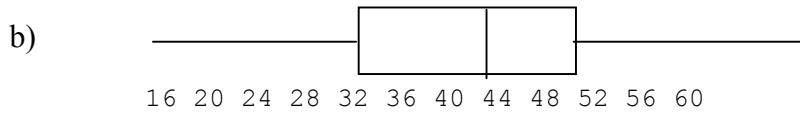
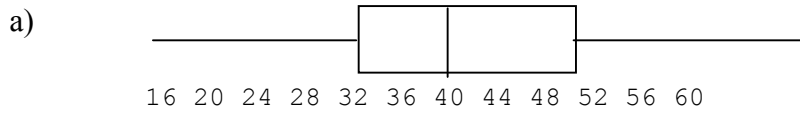


- a. The histogram has a gap.  
 b. There is an outlier at 100.  
 c. The histogram is skewed to the right.  
 d. The histogram is roughly symmetric.  
 e. The histogram is skewed to the left.

9.

|   |           |
|---|-----------|
| 1 | 67        |
| 2 | 229       |
| 3 | 0046      |
| 4 | 046778    |
| 5 | 111223399 |
| 6 | 03569     |

Which boxplot best corresponds to the stemplot above?





Name: \_\_\_\_\_

Section: \_\_\_\_\_

Instructor: \_\_\_\_\_

**The following questions are free response. Please show all work in order to receive credit.**

13. (12 pts.) Match the following terms with their definitions.

Voluntary response sample \_\_\_\_\_

Margin of error \_\_\_\_\_

Double blind experiment \_\_\_\_\_

Bias \_\_\_\_\_

Control group \_\_\_\_\_

Placebo effect \_\_\_\_\_

- a. A systematic error that tends to cause observations to deviate in the same direction from the truth about the population whenever a sample or experiment is repeated.
- b. A group of experimental subjects who are given a standard treatment or no treatment.
- c. A sample that consists of the individuals who are most easily available.
- d. An experiment in which neither the experimental subjects nor the persons who interact with them know which treatment each subject received.
- e. How close to the truth about the population the sample result would fall in 95% of all samples drawn by the method used to draw this one sample.
- f. An experiment to compare two or more treatments in which subjects are assigned to treatments by chance.
- g. A sample chosen by chance, so that every possible sample of the same size has an equal chance to be the one selected.
- h. An observed effect so large that it is unlikely to occur "just by chance" in the absence of a real effect in the population from which the data were drawn.
- i. A sample that chooses itself by responding to a general invitation to write or call with their opinion.
- j. The effects of two variables on the outcome of a study cannot be distinguished from one another.
- k. The effect of a dummy treatment on the response of subjects.

14.

| Team          | HRs |
|---------------|-----|
| Arizona       | 208 |
| Boston        | 198 |
| Chicago (AL)  | 214 |
| Chicago (NL)  | 194 |
| Cleveland     | 212 |
| Colorado      | 213 |
| Houston       | 208 |
| Los Angeles   | 206 |
| Milwaukee     | 209 |
| New York (AL) | 203 |
| Oakland       | 199 |
| San Francisco | 235 |
| St. Louis     | 199 |
| Texas         | 246 |
| Toronto       | 195 |

| Team          | HRs |
|---------------|-----|
| Anaheim       | 158 |
| Atlanta       | 174 |
| Baltimore     | 136 |
| Cincinnati    | 176 |
| Detroit       | 139 |
| Florida       | 166 |
| Kansas City   | 152 |
| Minnesota     | 164 |
| Montreal      | 131 |
| New York (NL) | 147 |
| Philadelphia  | 164 |
| Pittsburgh    | 161 |
| San Diego     | 161 |
| Seattle       | 169 |
| Tampa         | 121 |

The data above is the home run totals for all the major league baseball teams during 2001.

- a. Make a frequency table of the data. Use seven classes. (6 pts)

14b. Draw a stemplot of the data. (6 pts)

14c. Draw a boxplot of the data. (8 pts)

15. ( 8 pts.) Fizz laboratories, a pharmaceutical company, has hired you to design an experiment to test the effectiveness of a new pain-relief medication. You have decided that the experiment should involve 210 patients. Outline the design of an experiment to compare the drug's effectiveness with that of aspirin and a placebo.