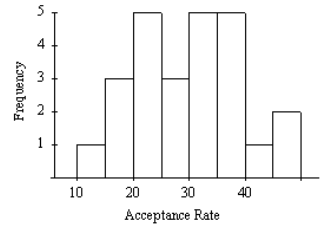


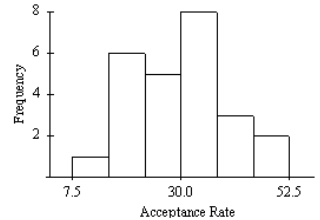
AP Statistics – Unit 1 (Chapters 1-6) Extra Practice: Part 1

- As part of survey of college students a researcher is interested in the variable class standing. She records a 1 if the student is a freshman, a 2 if the student is a sophomore, a 3 if the student is a junior, and a 4 if the student is a senior. The variable class standing is
 - Categorical
 - Numerical
 - Quantitatively categorical
 - all of the above
- A particularly common question in the study of wildlife behavior involves observing contests between “residents” of a particular area and “intruders.” In each contest, the “residents” either win or lose the encounter (assuming there are no ties). Observers might record several variables. Which of the following variables is categorical?
 - the duration of the contest (in seconds)
 - the number of animals involved in the contest
 - whether the “residents” win or lose
 - the total number of contests won by the “residents”
- In drawing a histogram, which of the following suggestions should be followed?
 - Leave large gaps between bars. This allows room for comments
 - The heights of bars should equal the class frequency
 - Generally, bars should be square so that both the height and width equal the class count
 - The scale of the vertical axis should be that of the variable whose distribution you are displaying

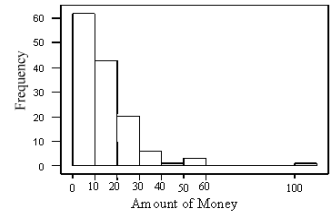
Each of the following two histograms represents the distribution of acceptance rates (percent accepted) among 25 business schools in 1995. The histograms use different class intervals but are based on the same data. In each class interval, the left endpoint is included but not the right.



- What percent of the schools have an acceptance rate of less than 20%?
 - 3%
 - 4%
 - 12%
 - 16%
- Which interval contains fewer than half of all the observations?
 - $20% < \text{acceptance rate} < 35%$
 - $22.5% < \text{acceptance rate} < 37.5%$
 - $25% < \text{acceptance rate} < 40%$
 - $30% < \text{acceptance rate} < 45%$

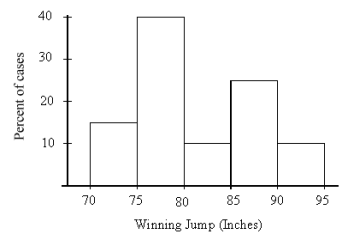


In a statistics class with 136 students, the professor records how much money each student has in his or her possession during the first class of the semester. The histogram below is of the data collected.



- The histogram
 - is skewed right
 - has an outlier
 - is not symmetric
 - all of the above
- The number of students with over \$30 in their possession is
 - less than 5
 - about 10
 - about 30
 - more than 100

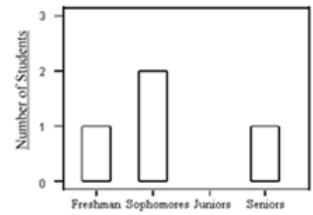
At the right is a histogram of the gold medal winning high jumps for the Olympic Games.



- The mean of this histogram is approximately
 - 75 inches
 - 77.5 inches
 - 82 inches
 - 90 inches
- The percentage of these winning jumps that were at least 7 feet (84 inches) is about
 - 9%
 - 14%
 - 23%
 - 37%

22. At the right is a bar graph of class standing for a seminar containing seven students who are either freshman, sophomores, juniors, or seniors. (The bar for the juniors has been omitted.) The number of students in the seminar who are juniors is

A) 1 B) 2 C) 3 D) unable to be determined



The timeplot below gives the number of burglaries committed each month for a city in Ohio. The plot is for the three-year period January 1987–December 1989.

25. The maximum number of burglaries for a month in 1988 was about

A) 20 B) 25 C) 30 D) 35



30. The ages of people in a class (to the nearest year) are as follows:

Age	18	19	20	21	22	23	24	25	32
Number of Students	14	120	200	200	90	30	10	2	1

What is true about the median age?

A) It must be 20 B) It could be any number between 19 and 21 C) it must be 21 D) it must be over 21

35. Suppose each employee in the company receives a \$3000 raise for next year (each employee's salary is increased by \$3000). The median salary for the employees working for the company will

A) be unchanged B) increase by \$3000 C) be multiplied by \$3000 D) increase by $\sqrt{\$3000}$

39. A set of data has a median that is much larger than the mean. Which of the following statements is most consistent with this information?

A) A stemplot of the data is symmetric B) A stemplot of the data is skewed left
 C) A stemplot of the data is skewed right
 D) The data set must be so large that it would be better to draw a histogram than a stemplot

40. In a class of 100 students, the grades on a statistics test are summarized in the following frequency table.

<u>Grade</u>	<u>Frequency</u>
91–100	11
81–90	31
71–80	42
61–70	16

The median grade is in which of the following intervals?

A) 61–70 B) 71–80 C) 81–90 D) 91–100

42. Which of the following is likely to have a mean that is smaller than the median?

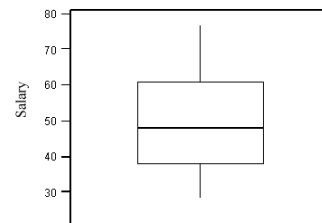
A) the salaries of all National Football League players
 B) the scores of students (out of 100 points) on a very easy exam in which most score perfectly, but a few do very poorly
 C) the prices of homes in a large city
 D) the scores of students (out of 100 points) on a very difficult exam on which most score poorly, but a few do very well

A sample was taken of the salaries of 20 employees of a large company. The following are the salaries (in thousands of dollars) for this year. For convenience, the data are ordered.

28 31 34 35 37 41 42 42 47
 49 51 52 52 60 61 67 72 75 77

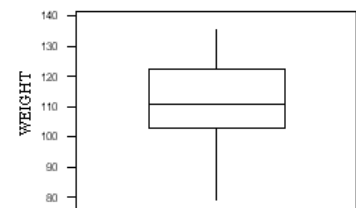
44. The first quartile of the 20 salaries is
 A) \$35,000 B) \$36,000 C) \$37,000 D) \$39,000
45. The interquartile range of the 20 salaries is
 A) \$19,000 B) \$19,500 C) \$21,500 D) \$49,000

A sample was taken of the salaries of 20 employees of a large company. The following is a boxplot of the salaries (in thousands of dollars) for this year.



52. Based on this boxplot, the 5-number summary is
 A) 28, 39, 49, 60.5, 77 B) 28, 41, 48, 58, 77
 C) 28, 39, 51, 58, 77 D) 28, 41, 51, 60.5, 77

The boxplot below is of the birthweights (in ounces) of a sample of 160 infants born in a local hospital.



53. The median birthweight is approximately
 A) 90 ounces B) 100 ounces C) 110 ounces D) 120 ounces
54. About 40 of the birthweights were less than
 A) 92 ounces B) 102 ounces C) 112 ounces D) 122 ounces
55. The number of children with birthweights between 100 and 120 ounces is approximately
 A) 40 B) 50 C) 80 D) 100

57. A sample was taken of the salaries of 20 employees of a large company. The following are the salaries (in thousands of dollars) for this year. For convenience, the data are ordered.

28 31 34 35 37 41 42 42 42 47
 49 51 52 52 60 61 67 72 75 77

Suppose each employee in the company receives a \$3000 raise for next year (each employee's salary is increased by \$3000). The standard deviation of the salaries for the employees will

- A) be unchanged B) increase by \$3000 C) be multiplied by \$3000 D) increase by $\sqrt{\$3000}$
58. The standard deviation of 16 measurements of people's weights (in pounds) is computed to be 5.4. The variance of these measurements is
 A) 2.24 B) 29.16 C) 52.34 D) 256
62. The rental values (in dollars) of a sample of four available apartments close to the university are
 470 600 580 550
 The standard deviation of the sample is
 A) \$30.31 B) \$35 C) \$57.15 D) \$49.50

Answer Key

1.A 3.C 7.B 8.D 9.D 11.D 12.B 13.C 14.D 22.C 25.D 30.A
 35.B 39.B 40.B 42.D 44.D 45.C 52.A 53.C 54.B 55.C 57.A 58.B 62.C

AP Statistics - Chapter 1B Extra Practice: Part 2

6. Items produced by a manufacturing process are supposed to weigh 90 grams. The manufacturing process is such, however, that there is variability in the items produced and they do not all weigh exactly 90 grams. The distribution of weights can be approximated by a normal distribution with mean 90 grams and a standard deviation of 1 gram. What percentage of the items will either weigh less than 87 grams or more than 93 grams?
A) 6% B) 94% C) 99.7% D) 0.3%
9. Using the standard normal distribution tables, what is the area under the standard normal curve corresponding to $Z < 1.1$? A) .1357 B) .2704 C) .8413 D) .8643
10. Using the standard normal distribution tables, what is the area under the standard normal curve corresponding to $Z > -1.22$? A) .1151 B) .01112 C) .8849 D) .8888
11. Using the standard normal distribution tables, what is the area under the standard normal curve corresponding to $-0.5 < Z < 1.2$? A) .3085 B) .8849 C) .5764 D) .2815

The temperature at any random location in a kiln used in the manufacture of bricks is normally distributed with a mean of 1000 and a standard deviation of 50° F.

12. If bricks are fired at a temperature above 1125°F, they will crack and must be discarded. If the bricks are placed randomly throughout the kiln, the proportion of bricks that crack during the firing process is closest to
A) 49.38% B) 2.28% C) 47.72% D) 0.62%
13. When glazed bricks are put in the oven, if the temperature is below 900°F they will miscolor. If the bricks are placed randomly throughout the kiln, the proportion of glazed bricks that miscolor is closest to
A) 49.38% B) 2.28% C) 47.72% D) 0.62%
14. Birthweights at a local hospital have a normal distribution with a mean of 110 ounces and a standard deviation of 15 ounces. The proportion of infants with birthweights under 95 ounces is
A) 0.500 B) 0.159 C) 0.341 D) 0.841
16. A market research company employs a large number of typists to enter data into a computer. The time taken for new typists to learn the computer system is known to have a normal distribution with a mean of 90 minutes and a standard deviation of 18 minutes. The proportion of new typists that take more than two hours to learn the computer system is
A) 0.952 B) 0.548 C) 0.048 D) 0.452

The distribution of actual weights of 8.0-ounce chocolate bars produced by a certain machine is normal with a mean of 8.1 ounces and a standard deviation of 0.1 ounces.

17. The proportion of chocolate bars weighing less than 8.0 ounces is
A) 0.500 B) 0.159 C) 0.341 D) 0.841
18. The proportion of chocolate bars weighing between 8.2 and 8.3 ounces is
A) 0.819 B) 0.636 C) 0.477 D) 0.136
19. Birthweights at a local hospital have a normal distribution with a mean of 110 ounces and a standard deviation of 15 ounces. The proportion of infants with birthweights between 125 ounces and 140 ounces is
A) 0.819 B) 0.636 C) 0.477 D) 0.136
20. The scores on a university examination are normally distributed with a mean of 62 and a standard deviation of 11. If the bottom 5% of students will fail the course, what is the lowest mark that a student can have and still be awarded a passing grade?
A) 62 B) 57 C) 44 D) 40
21. The time to complete a standardized exam is approximately normal with a mean of 70 minutes and a standard deviation of 10 minutes. How much time should be given to complete the exam so that 80% of the students will complete the exam in the time given?
A) 84 minutes B) 78.4 minutes C) 92.8 minutes D) 79.8 minutes

22. The time taken to prepare the envelopes to mail a weekly report to all executives in a company has a normal distribution with a mean of 35 minutes and a standard deviation of 2 minutes. On 95% of occasions the mailing preparation takes less than
- A) 38.29 minutes B) 31.71 minutes C) 35.25 minutes D) 34.75 minutes
24. The weights of packets of cookies produced by a certain manufacturer have a normal distribution with a mean of 202 grams and a standard deviation of 3 grams. The weight that should be stamped on the packet so that only 1% of packets are underweight is
- A) 209 grams B) 195 grams C) 202 grams D) there is not enough information to tell
26. A company produces packets of soap powder labeled "Giant Size 32 Ounces." The actual weight of soap powder in a box has a normal distribution with a mean of 33 ounces and a standard deviation of 0.7 ounces. Ninety-five percent of packets actually contain more than x ounces of soap powder. What is x ?
- A) 34.40 B) 34.15 C) 31.85 D) 31.60
27. The distribution of actual weights of 8-ounce chocolate bars produced by a certain machine is normal with a mean of 8.1 ounces and a standard deviation of 0.1 ounces. What weight should be put on the chocolate bar wrappers so that only 1% of bars are underweight?
- A) 7.77 ounces B) 8.33 ounces C) 7.87 ounces D) 8.23 ounces

Answer Key

- | | | | |
|-------|-------|-------|-------|
| 6. D | 13. B | 19. D | 26. C |
| 9. D | 14. B | 20. C | 27. C |
| 10. D | 16. C | 21. B | |
| 11. C | 17. B | 22. A | |
| 12. D | 18. D | 24. B | |