

Show all work to receive full credit. Supply explanations where necessary.

1. (12 points) Identify the type of sampling. Choose from random, systematic, convenience, stratified, or cluster.
 - (a) A reporter interviewed the neighbors of a person who was the focus of a story.
 - (b) A sample of words was obtained by selecting 20 pages at random from a book and collecting all the words on each of those pages.
 - (c) Ten customers are selected at random from each Walmart store in the United States.
 - (d) Students are each assigned a unique 4-digit code. Then a computer is used to randomly select 10 of the codes.
 - (e) ABC News organized an exit poll in which a few specific polling places were randomly selected and all voters at those polling places were surveyed as they left the premises.
 - (f) A biologist studying soil microbes took soil samples every 20 feet along a line.
2. (3 points) A table in the atrium was under a banner that read, "Please take our survey on abortion rights." 123 students took the survey. What is wrong with this survey?

3. (4 points) Explain why a systematic sample of 10 PSC students is not a simple random sample.
4. (3 points) Determine whether each data value comes from a discrete collection or a continuous collection of data.
- (a) The Apollo 10 spacecraft attained a record speed of 24,791 mph.
 - (b) A beehive contained 24,791 bees.
 - (c) Mount Gongga is 24,791 feet tall.
5. (6 points) Listed below are times (in minutes) spent on personal hygiene and grooming in the mornings from a randomly selected group of people.

0	5	12	15	15	20	22	24	25	25
25	27	27	28	30	30	35	35	40	45

Construct a relative frequency distribution with at least 5 classes.

6. (4 points) In each case, tell whether the number is accurate, precise, both, or neither.
- (a) The national debt currently stands at \$19 trillion.
 - (b) A news article claims the national debt is \$19,345,287.75.
7. (10 points) The frequency distribution shown below gives the salaries (in thousands of dollars) of the employees at Initech, Inc.

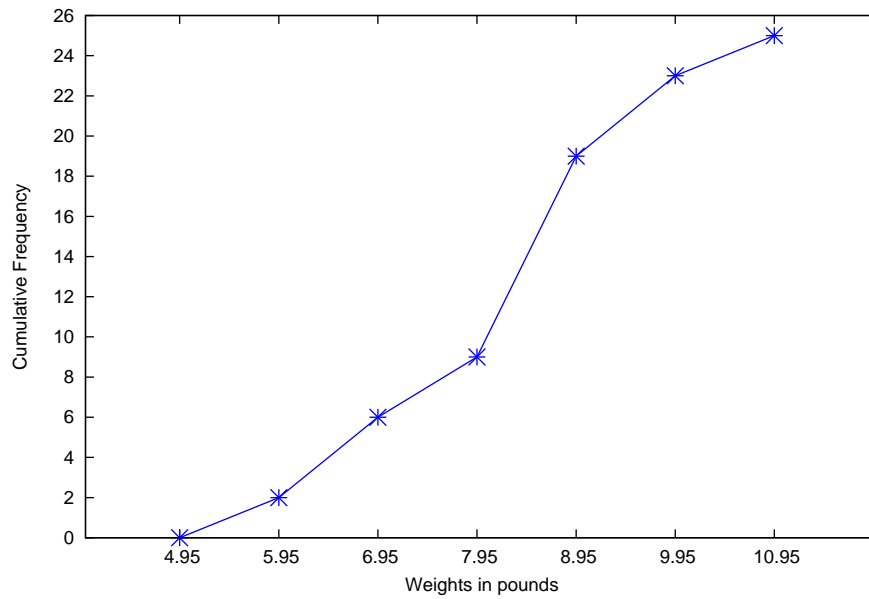
Salary (thousands of \$)	Frequency
14.5–29.9	5
30.0–45.4	13
45.5–60.9	27
61.0–76.4	26
76.5–91.9	15
92.0–107.4	3

- (a) What are the class boundaries associated with the last class listed above?
- (b) What is the class width?
- (c) What is the relative frequency of the third class listed above?
- (d) If the frequency distribution was changed to a cumulative frequency distribution, what count would be associated with “ \leq \$76,400”?
- (e) Does the distribution of salaries at Initech appear to be normal? Explain.

8. (6 points) Refer to the Initech problem on the previous page.
- (a) What are the class midpoints?
 - (b) Construct the frequency polygon associated with the frequency distribution. Label your axes.
9. (6 points) Determine the level of measurement. Choose from *nominal*, *ordinal*, *interval*, or *ratio*.
- (a) Social security numbers
 - (b) Temperatures measured in degrees centigrade
 - (c) Cities of birth of U.S presidents
 - (d) Seniority of members of the U.S. Senate
10. (2 points) A very famous study conducted in New Zealand in 2012 showed a strong correlation between marijuana smoking as a teen and lower IQ scores later in life. Does this study establish that smoking marijuana causes lower IQ scores? Explain.

11. (10 points) For each of the following situations, tell which type of graph would best display the data. Choose from *dot plot*, *bar graph*, *time-series graph*, *scatterplot*, *pie chart*, *ogive*, *histogram*, or *stem-and-leaf plot*. You may get partial credit if you offer brief explanations.
- (a) A geologist studying the eruption cycle of Old Faithful measures the duration of each eruption (in minutes) and the waiting time (in minutes) until the next eruption. She forms ordered pairs and plots the data.
 - (b) During a major telethon, fundraisers collected a large number of individual donations ranging from \$1.25 to \$12,999.99. Wanting to show the total number of donations, the telethon organizers construct a graph whose horizontal axis shows dollar ranges and whose vertical axis shows cumulative frequency.
 - (c) A teacher graded 25 tests, and they all had scores that were whole numbers between 35 and 48. She wants to display the entire set of scores.
 - (d) Climatologists construct a graph showing sea surface temperatures over the last 500 years.
 - (e) You share a 20 gigabyte cellular data plan with 4 other family members. Your service provider sends you a graph showing how data usage is shared between the 5 of you.

12. (15 points) The following ogive shows the distribution of birth weights of the full-term babies born last month at a local hospital.



- (a) How many babies are in the sample described by the ogive?
- (b) How many babies had birth weights between 8.95 lbs and 9.95 lbs?
- (c) In which range of birth weights were there the most babies?
- (d) In which range of birth weights were there the fewest babies?
- (e) Are birth weights continuous or discrete? Are numbers of babies continuous or discrete?
- (f) Assume the numbers along the horizontal axis represent class midpoints. Construct the corresponding histogram. Label your axes.

13. (5 points) Refer to the data in Problem #6 (the hygiene/grooming problem). Construct a stem-and-leaf plot for the data.
14. (6 points) In a study of the Marisa Waite diet, four subjects lost an average of 45 pounds. It was found that there is a 30% chance of getting such results without a diet. Do the results have practical significance? Do they have statistical significance? Explain your reasoning.
15. (4 points) On a certain sports team, the players' jerseys are numbered 1, 8, 17, 18, 23, 31, 40, 42, and 55.
- (a) Does it make sense to compute the average of the numbers? Explain.
- (b) Which of the following best describes the level of measurement of these numbers: nominal, ordinal, interval, or ratio?
16. (4 points) Identify the population and the sample: A survey of 1012 U.S. adults found that 5% consider pet-friendliness an important factor for choosing a hotel.