

Appendix D

Answers to Odd-Numbered Section Exercises, plus Answers to All Chapter Quick Quizzes, Chapter Review Exercises, and Cumulative Review Exercises

Chapter 1 Answers

Section 1-2

1. Statistical significance is indicated when methods of statistics are used to reach a conclusion that some treatment or finding is effective, but common sense might suggest that the treatment or finding does not make enough of a difference to justify its use or to be practical. Yes, it is possible for a study to have statistical significance but not practical significance.
3. A voluntary response sample is a sample in which the subjects themselves decide whether to be included in the study. A voluntary response sample is generally not suitable for a statistical study, because the sample may have a bias resulting from participation by those with a special interest in the topic being studied.
5. There does appear to be a potential to create a bias.
7. There does not appear to be a potential to create a bias.
9. The sample is a voluntary response sample and is therefore flawed.
11. The sampling method appears to be sound.
13. Because there is a 30% chance of getting such results with a diet that has no effect, it does not appear to have statistical significance, but the average loss of 45 pounds does appear to have practical significance.
15. Because there is a 23% chance of getting such results with a program that has no effect, the program does not appear to have statistical significance. Because the success rate of 23% is not much better than the 20% rate that is typically expected with random guessing, the program does not appear to have practical significance.
17. The male and female pulse rates in the same column are not matched in any meaningful way. It does not make sense to use the difference between any of the pulse rates that are in the same column.
19. The data can be used to address the issue of whether males and females have pulse rates with the same average (mean) value.
21. Yes, each IQ score is matched with the brain volume in the same column, because they are measurements obtained from the same person. It does not make sense to use the difference between each IQ score and the brain volume in the same column, because IQ scores and brain volumes use different units of measurement. It would make no sense to find the difference between an IQ score of 87 and a brain volume of 1035 cm^3 .
23. Given that the researchers do not appear to benefit from the results, they are professionals at prestigious institutions, and funding is from a U.S. government agency, the source of the data appears to be unbiased.
25. It is questionable that the sponsor is the Idaho Potato Commission and the favorite vegetable is potatoes.
27. The correlation, or association, between two variables does not mean that one of the variables is the cause of the other. Correlation does not imply causation.
29. a. 397.02 adults
b. No. Because the result is a count of people among the 1018 who were surveyed, the result must be a whole number.
c. 397 adults d. 25%
31. a. 322.28 adults
b. No. Because the result is a count of adults among the 2302 who were surveyed, the result must be a whole number.
c. 322 adults d. 2%
33. Because a reduction of 100% would eliminate all of the size, it is not possible to reduce the size by 100% or more.
35. If foreign investment fell by 100%, it would be totally eliminated, so it is not possible for it to fall by more than 100%.
37. Without our knowing anything about the number of ATVs in use, or the number of ATV drivers, or the amount of ATV usage, the number of 740 fatal accidents has no context. Some information should be given so that the reader can understand the *rate* of ATV fatalities.
39. The wording of the question is biased and tends to encourage negative responses. The sample size of 20 is too small. Survey respondents are self-selected instead of being selected by the newspaper. If 20 readers respond, the percentages should be multiples of 5, so 87% and 13% are not possible results.

Section 1-3

1. A parameter is a numerical measurement describing some characteristic of a population, whereas a statistic is a numerical measurement describing some characteristic of a sample.
3. Parts a and c describe discrete data.
5. Statistic 7. Parameter 9. Parameter
11. Statistic 13. Continuous 15. Discrete
17. Discrete 19. Continuous 21. Nominal
23. Interval 25. Ratio 27. Ordinal
29. The numbers are not counts or measures of anything, so they are at the nominal level of measurement, and it makes no sense to compute the average (mean) of them.
31. The numbers are used as substitutes for the categories of low, medium, and high, so the numbers are at the ordinal level of measurement. It does not make sense to compute the average (mean) of such numbers.
33. a. Continuous, because the number of possible values is infinite and not countable
b. Discrete, because the number of possible values is finite
c. Discrete, because the number of possible values is finite
d. Discrete, because the number of possible values is infinite and countable
35. With no natural starting point, temperatures are at the interval level of measurement, so ratios such as "twice" are meaningless.