

Disclaimer

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Chapter 4 Homework



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1. Define parameter.
2. Define statistic.
3. List 3 common measures of central tendency.
4. Compute the mean of the following data set:
44 45 92 45 67 91
5. Compute the mean of the following data set:
27 31 34 66 54 33
6. Compute the median of the following data set:
32 21 44 76 77 68
7. Compute the median of the following data set:
61 66 62 62 64 69
8. Determine the mode of the following data set:
16 18 21 20 21 22
9. Determine the mode of the following data set:
14 99 28 73 14 55
10. True or False. Adding "k" units to each data value will decrease the values of the mean, median and mode by "k" units.
11. True or False. Subtracting "k" units from each data value will not affect the values of the mean, median and mode by "k" units.
12. True or False. If 2 points are added to each test score in a data set, the mean will increase by 2 points.
13. True or False. The mode is rarely used when describing quantitative data. It is most preferred when describing qualitative data.
14. If the distribution is symmetrical, which measure of central tendency should be reported?
15. If the distribution is skewed, which measure of central tendency should be reported?
16. Fill in the blank. The mean will always be _____ than the median in skewed right distributions.
17. Fill in the blank. The mean will always be _____ than the median in skewed left distributions.



18. Fill in the blank. When the values of the mean and median are the same, the distribution is perfectly _____.
19. List 3 common measures of variation.
20. Compute the range of the following data set:
104 121 132 144 154
21. Compute the range of the following data set:
712 711 895 221 534
22. Compute the sample variance of the following data set:
320 313 345 366 333
23. Compute the sample variance of the following data set:
801 504 242 252 313
24. Compute the sample standard deviation of the following data set:
207 210 208 219 212
25. Compute the sample standard deviation of the following data set:
214 262 231 203 278
26. True or False. Adding "k" units to each data value will not affect the values of the range, variance, or standard deviation.
27. A set of test scores has a sample standard deviation of 10. If 4 points are added to each test score, what would be the values of the new sample standard deviation and sample variance?
28. State the Empirical Rule.
29. Apply the Empirical Rule to the following list of weights (in lbs.) from a sample of 5 people:
100 110 191 150 200
30. Define z-score.
31. The sample mean and standard deviation of a set of test scores were 85 and 3, respectively. Determine the z-score of a student who scored a 94.
32. The sample mean and standard deviation of a set of test scores were 54 and 10, respectively. Determine the z-score of a student who scored a 62.
33. A student took two tests. He scored a 62 on a chemistry test that had a sample mean of 72 and a sample standard deviation of 6. He scored a 75 on an ethics test that had a sample mean of 79 and a sample



- standard deviation of 2. On which test did the student perform worse? In other words, on which test did the student have a worse relative position?
34. A student took two tests. He scored an 81 on a writing test that had a sample mean of 79 and a sample standard deviation of 3. He scored a 73 on an astronomy test that had a sample mean of 75 and a sample standard deviation of 4. On which test did the student perform better? In other words, on which test did the student have a better relative position?
 35. Fill in the blank. If an observation has a z-score of 0, then the observation is _____ the mean.
 36. True or False. Z-scores are always positive.
 37. True or False. Z-scores that are less than -2 or greater than 2 are considered unusual. Z-scores that are less than -3 or greater than 3 are considered very unusual.
 38. Define percentile.
 39. Define quartiles.
 40. Determine the 25th percentile of the following data set:
20 29 30 25 20
 41. Write the five components of the five-number summary.
 42. Write the five steps to creating a boxplot.
 43. Define outliers.
 44. Identify the statistics that are considered resistant and the statistics that are considered nonresistant.
 45. Compute the five-number summary and determine any outliers, if applicable, of the following data set:
63 64 63 65 65



Answers

1. Parameter: a numerical summary gathered from a population.
2. Statistic: a numerical summary gathered from a sample.
3. Mean, median, mode
4. 64
5. 40.8
6. 56
7. 63
8. 21
9. 14
10. False
11. False
12. True
13. True
14. Mean
15. Median
16. Greater
17. Less
18. Symmetrical
19. Range, variance, standard deviation
20. 50
21. 674
22. 443.3
23. 55,886.3
24. 4.8
25. 31.7
26. True
27. Sample standard deviation = 10. Sample variance = 100
28. Empirical Rule: About 68% of the observations lie within 1 standard deviation of the mean. About 95% of the observations lie within 2 standard deviations of the mean. About 99.7% of the observations lie within 3 standard deviations of the mean.



29. About 68% of the observations are between 104.7 lbs and 195.7 lbs. About 95% of the observations are between 59.2 lbs and 241.2 lbs. About 99.7% of the observations are between 13.7 lbs and 286.7 lbs.
30. Z-score: a value that represents the number of standard deviations an observation is away from the mean.
31. 3
32. 0.8
33. Ethics test
34. Writing test
35. Equal to
36. False
37. True
38. Percentile: the percentage of observations that fall below a particular data value.
39. Quartiles: specific percentiles that divide the data set into 4 parts.
40. 20
41. Min, Q_1 , Med, Q_3 , Max
42. Step 1: Denote the minimum and maximum values as dots. Step 2: Draw a box using Q_1 and Q_3 as the ends. Step 3: Draw a vertical line inside the box at the median. Step 4: Draw a horizontal line from the minimum value to Q_1 and a horizontal line from Q_3 to the maximum value. Step 5: Denote any outliers with an asterisk.
43. Outliers: extremely large or small observations.
44. The median and interquartile range are resistant measures. The mean and standard deviation are nonresistant measures.
45. 63, 63, 64, 65, 65. No outliers.

