Methods for Describing Sets of Data

2.1 Describing Data Graphically

To complete this section of homework watch Chapter Two, Lecture Examples: 7, 8, 9, 10, 11 and 12.

1. Why do we construct frequency tables/distributions?

2. What advantages does a **relative** frequency table/distribution have over a frequency table/distribution?

For problems 3 – 6, determine the class width, the class boundaries, and the relative frequencies:

3. Shopping Cart Contents: number of high-calorie, processed food items

Items	Frequency
0 - 5	2
6 – 11	4
12 – 17	10
18 – 23	36
24 – 29	7

4. Male heights VS

Heights	Frequency
60 – 63.9	4
64 – 67.9	9
68 – 71.9	15
72 – 75.9	8
76 – 79.9	3

: *indicates the exercise has a video devoted to it in the corresponding section of STATSprofessor.com*

5. Laptop Battery Performance

Hours	frequency
0.5 – 0.9	10
1.0 – 1.4	56
1.5 - 1.9	14
2.0 – 2.4	10
2.5 – 2.9	2

6. Diameter of Genetically Modified Cucumbers

Diameter	Frequency
2.00 – 3.99	1
4.00 – 5.99	5
6.00 – 7.99	23
8.00 – 9.99	11
10.00 – 11.99	2

7. If the smallest number in a data set is 21, the largest is 110, and we want to create a frequency table with 6 classes, what should your class width be?

8. If the smallest number in a data set is 11, the largest is 89, and we want to create a frequency table with 6 classes, what should your class width be?

9. If the smallest number in a data set is 1, the largest is 76, and we want to create a frequency table with 5 classes, what should your class width be?

10. If the smallest number in a data set is 21, the largest is 111, and we want to create a frequency table with 18 classes, what should your class width be? VS

11. Why do we construct histograms?

: *indicates the exercise has a video devoted to it in the corresponding section of STATSprofessor.com*

12. Construct a histogram for the following set of 42 test scores; use five classes and start your first class at 40. Test scores: 40, 50, 50, 55, 55, 55, 60, 65, 65, 70, 70, 70, 70, 70, 70, 75, 75, 75, 75, 75, 75, 75, 75, 75, 75, 80, 80, 80, 80, 85, 85, 85, 90, 90, 90, 90, 90, 95, 95, 95, 95. VS

13. Construct a histogram for the following set of 31 class averages; use five classes and start your first class at 17. Final Averages: 17, 27, 28, 58, 60, 61, 63, 67, 70, 71, 71, 71, 71, 73, 73, 75, 83, 83, 85, 86, 87, 87, 88, 89, 91, 92, 94, 96, 97, 99, 100.

2.1 Answers:

1. To organize and summarize data, and it is often the first step when creating some sort of visual display of the data such as a pie chart, bar graph, or histogram.
2. A relative frequency table/distr. reports the proportion or percent of the sampled data that fits in the particular category. It also makes the graph of the data more manageable since there is a fixed range for the relative frequencies. Finally, comparisons between different relative frequency tables/distr. are easy even if the sample sizes involved in the creation of the tables/distr. are very different. To compare frequency tables/distr. with different sample sizes, it is necessary to convert them into relative frequency tables/distributions.

3.

Items	Frequency	Boundaries	Rel. Freq
0 - 5	2	-0.5 – 5.5	0.034
6 – 11	4	5.5 – 11.5	0.068
12 – 17	10	11.5 – 17.5	0.169
18 – 23	36	17.5 – 23.5	0.610
24 – 29	7	23.5 – 29.5	0.119

4.

Heights	Frequency	boundaries	Rel. freq.
60 – 63.9	4	59.95 – 63.95	0.103
64 – 67.9	9	63.95 – 67.95	0.231
68 – 71.9	15	67.95 – 71.95	0.385
72 – 75.9	8	71.95 – 75.95	0.205
76 – 79.9	3	75.95 – 79.95	0.077

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2.1 Answers:

5.

Hours	frequency	boundaries	Rel. freq.
0.5 – 0.9	10	0.45 – 0.95	0.109
1.0 – 1.4	56	0.95 – 1.45	0.609
1.5 - 1.9	14	1.45 – 1.95	0.152
2.0 – 2.4	10	1.95 – 2.45	0.109
2.5 – 2.9	2	2.45 – 2.95	0.022

6.

Diameter	Frequency	boundaries	Rel. Freq.
2.00 – 3.99	1	1.995 – 3.995	0.024
4.00 – 5.99	5	3.995 – 5.995	0.119
6.00 – 7.99	23	5.995 – 7.995	0.548
8.00 – 9.99	11	7.995 – 9.995	0.262
10.00 – 11.99	2	9.995 – 11.995	0.048

 : *indicates the exercise has a video devoted to it in the corresponding section of STATSprofessor.com*

2.1 Answers:

7. 15 would work fine here:

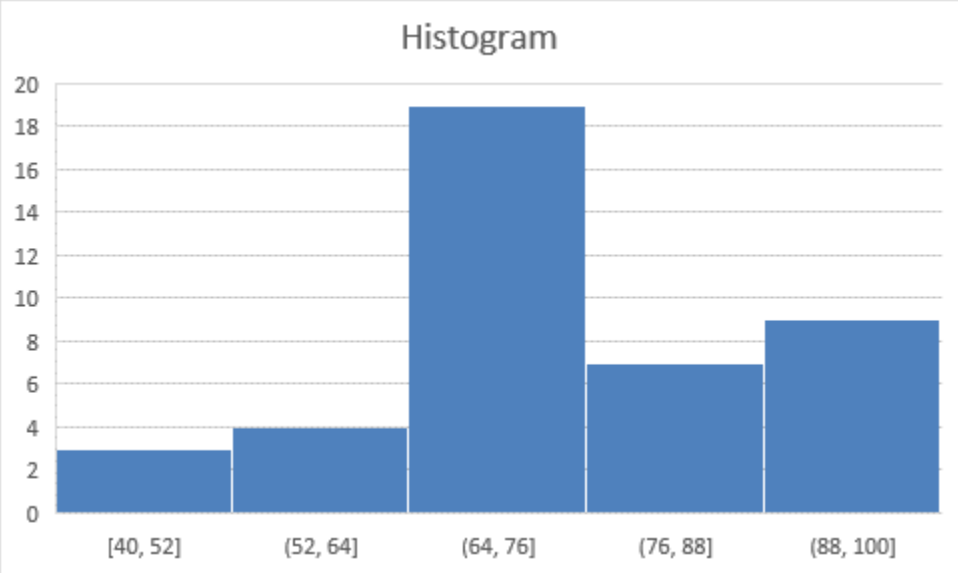
Classes
21 – 35
36 – 50
51 – 65
66 – 80
81 – 95
96 – 110

8. 13 will not work, but 14 works fine (our largest value,89, is inside the last class):

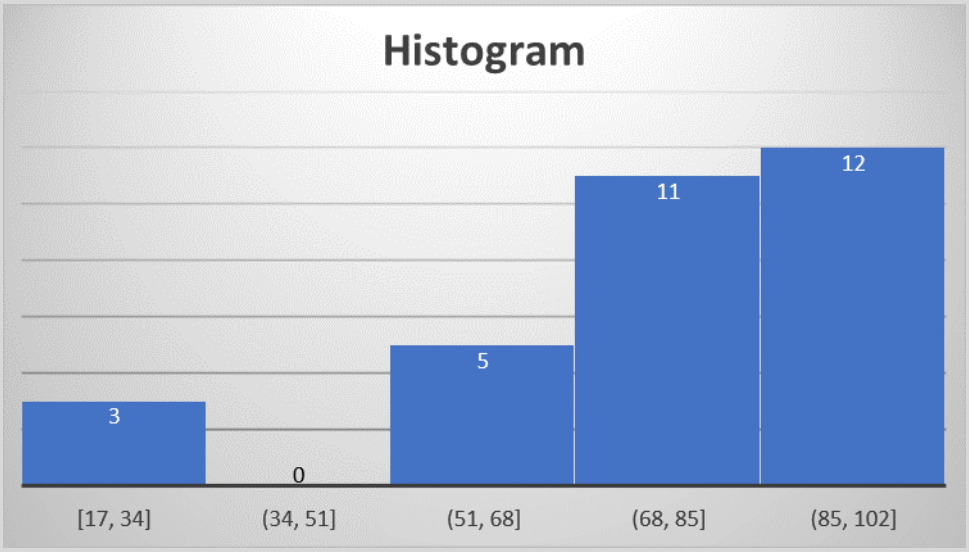
Classes
11 – 24
25 – 38
39 – 52
53 – 66
67 – 80
81 - 94

2. 3 Answers

9. 15 will not work, but 16 does (76 is in the last class when we use a width of 16).
10. Answers can vary, but 5.1 would work. Notice that 5 will not work-try it out.
11. We construct histograms to visually represent the distribution of the data. A graph conveys the shape of the distribution better than the frequency distribution does in table form.
12. Answers will vary depending on the class width (below I used 12):



13. Answers will vary depending on the class width:



Need more exercises?

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2.2 Summation Notation

To complete this section of homework watch Chapter Two, Lecture Examples: 16 and 16.5.

14. Find $\sum_{i=1}^{n} x_i, \left(\sum_{i=1}^{n} x_i\right)^2$, and $\sum_{i=1}^{n} x_i^2$ for the following set of data: 4, -3, 7, 3, -10, and 9.

15. Find $\sum_{i=1}^{n} x_i, \left(\sum_{i=1}^{n} x_i\right)^2$, and $\sum_{i=1}^{n} x_i^2$ for the following set of data: 1, 2, -3, 3, 0, and 4.

16. Find $\sum_{i=1}^{n} x_i - 4$ and $\sum_{i=1}^{n} (x_i - 4)$ for the following data set: 7, 9, 2, -1, and 3. VS

17. Find $\sum_{i=1}^{n} (x_i - 4)^2$ for the following data set: 7, 9, 2, -1, and 3.

18. Find $\sum_{i=1}^{n} x_i^2 - 4$ for the following data set: 17, 18, 20, -15, and 6.

19. Find $\sum_{i=1}^{n} x_i^2 - \frac{\left(\sum_{i=1}^{n} x_i\right)^2}{4}$ using the following data {1, 2, 3, 4}.

2.2 Answers:

14. 10, 100, and 264
15. 7, 49, and 39
16. 16 and 0
17. 64
18. 1,270
19. 5

Need more exercises?

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2.3 Measures of Central Tendency: Mean, Median, Mode

To complete this section of homework watch Chapter Two, Lecture Example 18 and the concept video.

20. Find the mean, median, and mode for the following FPL electric bill amounts:

Jan-09	$52.28	Jul-09	$146.23
Feb-09	$91.38	Aug-09	$215.94
Mar-09	$119.02	Sep-09	$204.80
Apr-09	$85.74	Oct-09	$209.10
May-09	$103.44	Nov-09	$204.80
Jun-09	$163.14	Dec-09	$102.36

21. Find the mean, median, and mode for the following earnings data for a person who started working at age 14 in 1989.

1989	1990	1991	1992	1993	1994	1995
$815.00	$2,187.00	$1,627.00	$226.00	$4,242.00	$10,316.00	$8,057.00
1996	1997	1998	1999	2000	2001	2002
$11,568.00	$9,236.00	$9,968.00	$12,487.00	$224.00	$0.00	$14,979.00
2003	2004	2005	2006	2007	2008	2009
$18,053.00	$20,100.00	$41,097.00	$47,767.00	$45,501.00	$55,959.00	$69,251.00

22. Which measure of the center would you recommend to best represent the data above: mean, median, or mode? Why?

23. A branch of a local bank decides to try two different approaches to manage their lines of customers. For one Friday, the branch used only one line. As one of the four tellers became free, customers moved into the open window position. On another Friday, customers choose any of four lines with a teller at each end. A sample of some of the waiting times in minutes is included below for each of the two different line strategies. Calculate the mean for each strategy and compare them. What do you notice?

    Single Line: 6.5, 6.6, 6.7, 6.8, 7.1, 7.3, 7.4, 7.7, 7.7, 7.7

    Multiple Lines: 4.2, 5.4, 5.8, 6.2, 6.7, 7.7, 7.7, 8.5, 9.3, 10.0

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24. A list of home sales (from 2009) in the zip code 33441 is included below. Which measure of the center would be most appropriate: mean, median, or mode?

    Selling price: $226,102; $305, 100; $198,660; $315, 000,
    $266,100; $4,505, 000; $356,400; $335, 500

25. A random sample of FIU freshmen were polled to determine what kind of high school they attended: public, private, or home school. The results are below. Which measure of the center would be most appropriate: mean, median, or mode?

    private, public, public, public, private, private, public, public, public, home school, public, private

26. A professional organization for attorneys would like to report the typical earnings of their members. If the group consists of a mix of corporate attorneys, family law attorneys, real estate attorneys, and several (low-paid) public defenders, what measure of the center would be most appropriate? VS

27. In general, between the mean and median, the mean is the preferred measure of the center. Why?

2.3 Answers:

20. Mean: 141.52, Median: 132.63, Mode: 204.80
21. Mean: 18,269.52, Median: 10,316.00, Mode: no mode
22. Median, because the zero and the years with very little pay are extreme values that heavily influence the mean. Also, this data reflects two different phases of life for the worker (youth and adulthood). This person did not earn a lot in his/her younger years, but then earns much more in the second half. The median states that for half of the provided years the worker made more than $10,316.00.
23. 7.15, for both, but the multiple line scenario seems more varied. Some people wait half as long as others in that line.
24. Median due to the extreme value, $4,505, 000.
25. Mode
26. Median due to the low-paid public defenders potentially skewing the mean left.
27. The median ignores every value in the data set except the middle value(s). The median is not sensitive to differences between data sets that have the same middle number because it is calculated from the middle one or two data points. We prefer the mean because the mean receives input from every data value. This makes the mean sensitive to even small differences between data sets. At times this sensitivity can be a weakness (for example, when there are outliers on one side of a distribution), but in general, the sensitivity of the mean is desirable.

Need more exercises?

: *indicates the exercise has a video devoted to it in the corresponding section of STATSprofessor.com*

2.4 Skewed Distributions

To complete this section of homework watch Chapter Two, Lecture Examples 19, 20, and 21.

28. If the population mean for a measurement is 98.3 and the population median for the same measurement is 92.6, the population is most likely: Left-skewed, Right-Skewed, or Symmetric?

29. If the population mean for a measurement is 12.4 and the population median for the same measurement is 15.8, the population is most likely: Left-skewed, Right-Skewed, or Symmetric?

30. If the population mean for a measurement is 76 and the population median for the same measurement is 76, the population is most likely: Left-skewed, Right-Skewed, or Symmetric?

31. In a right-skewed distribution the order of the mean, median, and mode on the number line from left to right is:

    A. Mean, Mode, Median
    B. Median, Mean, Mode
    C. Mode, Mean, Median
    D. Mode, Median, Mean

32. True or False: In a bell curve, the mean, median, and mode are all in the same place.

33. At the World Cup a statistician keeps track of the time when every first goal in a match is scored. The statistician reported that the mean time it takes for a goal to be scored is 35.3 minutes. Suppose that the statistician indicated that the time-to-first-goal distribution was skewed to the right. Which of the following values is most likely the value of the median time-to-first goal? VS

    A. 44.6
    C. 38.1
    B. 32.5
    D. 35. 9

2.4 Answers:

28. Right Skewed
29. Left skewed
30. Symmetric
31. D
32. True
33. B

Need more exercises?

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2.5 Measures of Variability: Range, Standard Deviation, and Variance

To complete this section of homework watch Chapter Two, Lecture Examples 22, 23, and the concept video.

34. Find the Range, Variance, and the Standard Deviation for the following FPL electric bill amounts:
(Note, use the following to speed the calculations:
$n = 12, \sum X = \$1{,}698.23, \sum X^2 = \$276{,}014.86$) VS

Jan-09	$52.28	Jul-09	$146.23
Feb-09	$91.38	Aug-09	$215.94
Mar-09	$119.02	Sep-09	$204.80
Apr-09	$85.74	Oct-09	$209.10
May-09	$103.44	Nov-09	$204.80
Jun-09	$163.14	Dec-09	$102.36

35. What would the units for the standard deviation be in the problem above? What units would the variance have?

36. Find the Range, Variance, and the Standard Deviation for the following earnings data for a person who started working at age 14 in 1989. VS

(Note, use the following to help speed up the calculations:
$\sum X = \$383{,}660.00, \sum X^2 = \$15{,}594{,}326{,}388.00$)

1989	1990	1991	1992	1993	1994	1995
$815.00	$2,187.00	$1,627.00	$226.00	$4,242.00	$10,316.00	$8,057.00
1996	1997	1998	1999	2000	2001	2002
$11,568.00	$9,236.00	$9,968.00	$12,487.00	$224.00	$0.00	$14,979.00
2003	2004	2005	2006	2007	2008	2009
$18,053.00	$20,100.00	$41,097.00	$47,767.00	$45,501.00	$55,959.00	$69,251.00

37. What measure of variation is more appropriate for the problem above, the range or the standard deviation? Why?

38. True or False: The range is a useful measure of dispersion (variation) for very small data sets (for example, a handful of measurements) because it is easy to calculate and interpret; however, it is too insensitive to be used for larger data sets.

39. A branch of a local bank decides to try two different approaches to manage their lines of customers. For one Friday, the branch used only one line. As one of the four tellers became free, customers moved into the open window position. On another Friday, customers choose any of four lines with a teller at each end. A sample of some of the waiting times in minutes is included below for each of the two different line strategies. Calculate the standard deviation for each strategy and compare them. What do you notice?

    Single Line: 6.5, 6.6, 6.7, 6.8, 7.1, 7.3, 7.4, 7.7, 7.7, 7.7

    Multiple Lines: 4.2, 5.4, 5.8, 6.2, 6.7, 7.7, 7.7, 8.5, 9.3, 10.0

    (Note, use the following to speed the calculations. Single line: $\sum X = 71.5, \sum X^2 = 513.27, n = 10$; multiple lines: $\sum X = 71.5, \sum X^2 = 541.09, n = 10$)
    VS

40. What would the units for the standard deviation be in the problem above? What units would the variance have?

41. Developing your intuition: Which do you think has more variation: the 100-yard dash finishing times for the 20-member track and field team at a local prep school or the 100-yard dash finishing times for twenty randomly chosen members of the faculty from the same school? VS

42. Developing your intuition: Which do you think has more variation: the weights of 28 heavy weight wrestlers or the weights of 28 starters for the Minnesota Vikings football team (note: footballers come in many shapes, weights, and sizes)?

43. Developing your intuition: Which do you think has more variation: the ages of 16 randomly chosen elementary school children or the ages of 16 randomly chosen high school seniors?

44. Developing your intuition: Which do you think has more variation: the IQs of 10 randomly chosen college professors or the IQs of 10 randomly chosen customers at the mall?

45. If X and Y have the same mean, but X has a standard deviation of 26.3 seconds and Y has a standard deviation of 12.1 seconds, which variable exhibits the stronger central tendency?

2.5 Answers:

34. Variance:3,243.89, Standard Deviation: 56.96, Range: 163.66
35. St. Dev: dollars; Variance: dollars squared
36. Variance: 429,252,044.2, Standard Deviation: 20,718.40 , Range: 69,251.00
37. Standard deviation, there are too many values to use the range.
38. True
39. Single line: s = 0.477; Multiple lines: s = 1.822; Single line because the waiting time is more predictable. For example, you could promise that the line should take between 6 and 8 minutes with a reasonable certainty.
40. Minutes for the st. dev.; minutes squared for variance.
41. The faculty times would be more varied.
42. The Vikings' weights would be more varied, since some of the players are super heavy while others (like the kicker) are much smaller.
43. The elementary school kids have more varied ages.
44. The customer IQs would be more varied.
45. Y has more clustering (greater central tendency) because it has a smaller standard deviation.

Need more exercises?

2.6 Chebyshev's Theorem

To complete this section of homework watch Chapter Two, Lecture Examples 24, 24.5, and the video on Range Rule of Thumb.

46. In the FPL data we worked with above for the twelve-month period, the lowest amount was $52.28, and the highest amount was $215.94. Using these values and the range rule of thumb, estimate the standard deviation for the data. Hint: form an interval where we might find sigma using, (R/6, R/4).

47. A tall woman might be 72 inches tall, and a short woman might be 59 inches tall. Use these values and the range rule of thumb to estimate the standard deviation for women's heights.

48. The average check at a local restaurant is $36.42 with a standard deviation of $8.15. What is the minimum percentage of checks between $15.23 and $57.61? VS

49. The average woman spends 60 minutes getting ready to leave the house for work. If the standard deviation is 15.8 minutes, what is the minimum percentage of women who will spend between 20 minutes and 100 minutes getting ready? VS

50. The average woman spends 60 minutes getting ready to leave the house for work. If the standard deviation is 15.8 minutes, what percentage of women will spend more than 110 minutes getting ready? VS

51. In the FPL problem from above, we saw that the average bill was $141.52 and the standard deviation was $56.96. Assuming these values are a good estimate of the population values, what percentage of bills will be higher than $215.00?

: *indicates the exercise has a video devoted to it in the corresponding section of STATSprofessor.com*

52. If the average time to a major repair for a Toyota Corolla is 8 years with a standard deviation of 0.9 years, what percent of Toyotas will have a major repair before the car is paid off (assume a 5-year car payment)? Does this car seem like a safe buy? VS

2.6 Answers:

46. Dividing the range by 4, we get $40.92. Dividing the range by 6, we get $27.28. ($27.28, $40.92)
47. Dividing the range by 4 we get 3.25". Dividing by 6, we get 2.17". (2.17", 3.25")
48. Chebyshev's Rule: 85.2% is the minimum percentage between the two given limits.
49. 84.4% is the minimum percentage between the two given limits.
50. At most 10% (because at least 90% will take between 10 and 110 minutes).
51. At most 60% (because at least 40% will be between 68.04 and 215 dollars).
52. At most 9% (because at least 91% will last between 5 and 11 years before the first major repair). I think it seems like a safe buy.

Need more exercises?

2.7 Empirical Rule

To complete this section of homework watch Chapter Two, Lecture Examples 25 and 26.

53. Women's heights are normally distributed with an average height of 64 inches and a standard deviation of 2.5 inches. Approximately what percentage of women are between 56.5 inches tall and 71.5 inches tall (4'8.5'' and 5'11.5'')?

54. Women's heights are normally distributed with an average height of 64 inches and a standard deviation of 2.5 inches. Approximately what percentage of women are shorter than 4'11'' (59 inches) tall? VS

55. Men's weights are normally distributed with a mean of 172 pounds and a standard deviation of 26 pounds. Approximately what percentage of men are heavier than 224 pounds?

56. Men's heights follow a bell-shaped distribution with a mean of 68 inches and a standard deviation of 2.8 inches. Create an interval that contains 95% of men's heights.

57. Men's weights are normally distributed with a mean of 172 pounds and a standard deviation of 26 pounds. Approximately what percentage of men are between 120 and 198 pounds? VS

2.7 Answers:

53. Empirical rule: 99.7%
54. 2.5%
55. 2.5%
56. 62.4 to 73.6 [subtract (and add) 2 standard deviations from (and to) the mean to get the interval].
57. 81.5%

Need more exercises?

: *indicates the exercise has a video devoted to it in the corresponding section of STATSprofessor.com*

2.8 Measures of Relative Standing – Z scores

To complete this section of homework watch Chapter Two, Lecture Examples 27 and 27.5.

58. The tallest woman in the world is 91.25 inches tall. If the mean for women's heights is 64 inches with a standard deviation of 2.5 inches, how many standard deviations above average is the tallest woman's height?

59. Men have an average height of 69 inches with a standard deviation of 2.8 inches. If Shaquille O'Neil stands at 85 inches tall, is his height unusual? Why? VS

60. If the average electric bill at my house is $142 with a standard deviation of $56. Should I be concerned that a bill of $311 is unusually high?

61. For taxpayers who make $140,000 per year, the average amount of tax owed to the government is $18,200 with a standard deviation of $1500. If the IRS receives a 1040 tax document from a taxpayer who earned $140,000 that claims he only owes $12,000, should the IRS suspect the taxpayer has likely made an error? VS

62. Jim knows that the average pregnancy lasts 268 days with a standard deviation of 15 days. A girl he once dated but hasn't seen in 330 days shows up at his door with a two-week-old child saying the baby is his. Jim thinks she is lying. Would this girl have to have carried for an unusual length of time for the child to be Jim's? VS

63. Which score is relatively better? A 68 in a class where the average is a 65 and the standard deviation is 10, or a 72 in a class where the average is a 67 with a standard deviation of 15?

64. Which score is relatively better? A 56 in a class where the average is a 65 and the standard deviation is 8, or a 72 in a class where the average is an 80 with a standard deviation of 7? VS

65. Which is relatively better? A 78 in a class where the average is a 70 and the standard deviation is 6, or a 72 in a class where the average is a 64 with a standard deviation of 5? VS

2.8 Answers:

58. 10.9, this is very unusual!
59. His Z score is 5.71. Yes, he is very unusual.
60. Yes, the z score is 3.02. This is unusual.
61. Yes, the IRS should question his return because the z-score for his return is -4.13.
62. Yes, it seems unlikely that Jim's the father. The z-score for this pregnancy length is 3.20 (don't forget to subtract the two weeks from the 330 days).
63. The 72 is better because the z score is higher.
64. The 56 is a little better (they are both below average, but -1.13 is a higher number than -1.14).
65. The 72 is better.

Need more exercises? Take a sample exam for chapter 1 & 2

: *indicates the exercise has a video devoted to it in the corresponding section of STATSprofessor.com*

Chapter 2 Mixed Review

66. Calculate the standard deviation for a set of 12 values that have the following summary values:

$\sum_{i=1}^{n} x_i = 357.9$ and $\sum_{i=1}^{n} x_i^2 = 61,084.3$

67. Under typical use, a cell phone has an average battery life of 5.21 hours and a standard deviation of 0.45 hours. What is the minimum percentage of phones that will last between 3.42 hours and 7.00 hours?

68. When extreme values are asymmetrically distributed in a data set (i.e., extreme values are more extreme on one side of the distribution than the other), the _____ is a suitable measure of the center.

69. The following frequency distribution contains heights of women. Find the class boundaries for the third class.

Inches	Frequencies
58 - 61.9	15
62 - 65.9	34
66 - 69.9	20
70 - 73.9	8
74 - 77.9	2

70. True or False: The range is easy to calculate and easy to understand, but it is insensitive as a measure of variation for data sets with many values.

71. The largest value in a set of data is 32. The smallest is 2. If we wish to create a frequency table for the data that has 5 classes, what class width should we use?

A. 8 B. 6 C. 5 D. 7 E. 30 F. None of these

72. Use the provided values to find the sum: {7, 8, 1, 4, 6, -9} $\sum_{i=1}^{n} (x_i - 4)^2$

73. Women's heights have a bell-shaped distribution with a mean of 64 inches and a standard deviation of 2.5 inches. Approximately what percent of women are between 56.5 inches and 61.5 inches tall?

74. The average commute to campus takes 42.3 minutes with a standard deviation of 8.4 minutes. What percent of commutes are longer than 75 minutes?

75. If the average commute to campus takes 42.3 minutes with a standard deviation of 8.4 minutes, would a 60-minute commute be unusual?
76. Developing your intuition: Which group of measurements would likely exhibit more variation: the weights of pennies or the weights of city bus passengers?
77. Who earns more money relative to their peers? A barber earns $21.50 per hour. A mechanic earns $22.75 per hour. The average salary for barbers is $14.25 with a standard deviation of $2.26. The average salary for mechanics is $17.15 with a standard deviation of $2.37.

Chapter 2 Mixed Review Answers

66. 67.7
67. at least 93.7%
68. median
69. 65.95 - 69.95
70. true; remember, many (very different) data sets can have the same range
71. D. 7
72. 207
73. 15.85%
74. at most 6.6%
75. yes, because it has a z score of 2.11
76. the bus passengers because they come in all different sizes
77. the barber because his wage has a z score of 3.21.

Bonus material: Coefficient of variation. We cannot compare the variation directly for two variables that are measured in different units, but we can calculate a unit-less measure called the Coefficient of Variation (CV). If the CV for one variable is smaller than the CV for another it has less variation. Let's compare men's heights and weights to see which varies more:

	Mean ($\bar{x}$)	Standard Deviation (s)
Height	68.34 in.	3.02 in.
Weight	172.55 lb	26.33 lb

We calculate the CV by using the following formula: $CV = \frac{S}{\bar{X}} 100\%$

$$\text{Heights:} \quad CV = \frac{s}{\bar{x}} \cdot 100\% = \frac{3.02 \text{ in.}}{68.34 \text{ in.}} \cdot 100\% = 4.42\%$$

$$\text{Weights:} \quad CV = \frac{s}{\bar{x}} \cdot 100\% = \frac{26.33 \text{ lb}}{172.55 \text{ lb}} \cdot 100\% = 15.26\%$$

: *indicates the exercise has a video devoted to it in the corresponding section of STATSprofessor.com*