

2. The same dealership decides to test fuel efficiency of SUVs. It selects six SUVs on its lot for the test. The fuel efficiencies (in miles per gallon) of these cars are shown below.

21 21 21 30 28 24

Calculate the mean and the standard deviation of these values. Be sure to show your work, and include a unit in your answer.

3. Consider the following questions regarding the cars described in Problems 1 and 2.
- What is the standard deviation of the fuel efficiencies of the cars in Problem 1? Explain what this value tells you.
 - You also calculated the standard deviation of the fuel efficiencies for the cars in Problem 2. Which of the two data sets (Problem 1 or Problem 2) has the larger standard deviation? What does this tell you about the two types of cars (sedans and SUVs)?

Ignore.
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Lesson 6.

Lesson 6: Interpreting the Standard Deviation

Classwork

Example 1

Your teacher will show you how to use a calculator to find the mean and standard deviation for the following set of data.

A set of eight men have heights (in inches) as shown below.

67.0 70.9 67.6 69.8 69.7 70.9 68.7 67.2

Indicate the mean and standard deviation you obtained from your calculator to the nearest hundredth.

Mean: 68.85

Standard Deviation: 1.55

Exercise 1

1. The heights (in inches) of nine women are as shown below.

68.4 70.9 67.4 67.7 67.1 69.2 66.0 70.3 67.6

Use the statistical features of your calculator or computer software to find the mean and the standard deviation of these heights to the nearest hundredth.

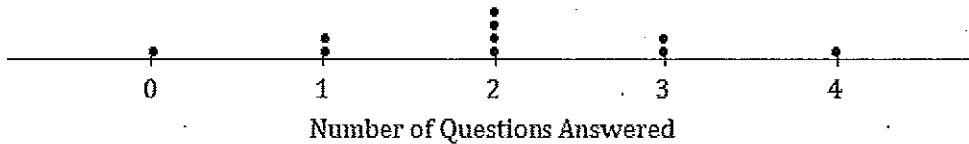
Mean: 68.29

Standard Deviation: 1.58

Exploratory Challenge/Exercises 2–5

2. A group of people attended a talk at a conference. At the end of the talk, ten of the attendees were given a questionnaire that consisted of four questions. The questions were optional, so it was possible that some attendees might answer none of the questions, while others might answer 1, 2, 3, or all 4 of the questions (so, the possible numbers of questions answered are 0, 1, 2, 3, and 4).

Suppose that the numbers of questions answered by each of the ten people were as shown in the dot plot below.

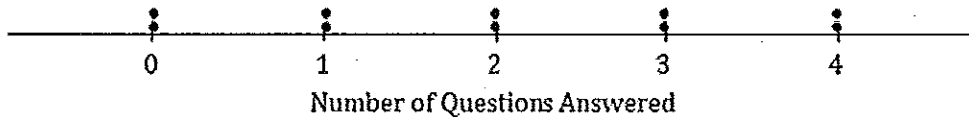


Use the statistical features of your calculator to find the mean and the standard deviation of the data set.

Mean: 2

Standard Deviation: 1.15

3. Suppose the dot plot looked like this:



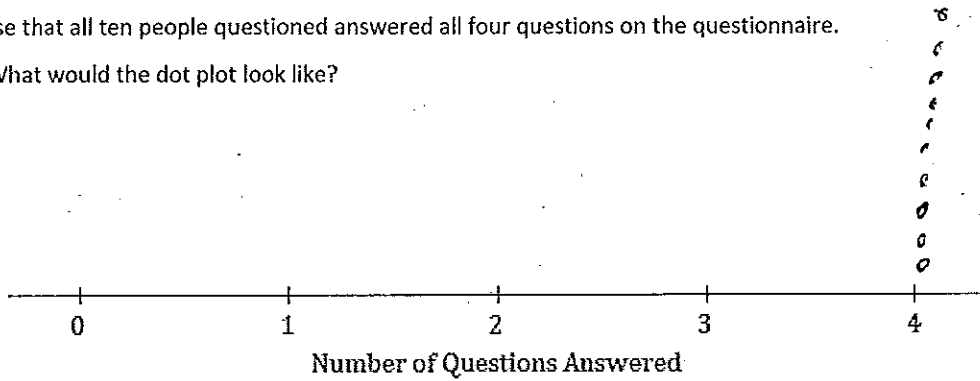
- a. Use your calculator to find the mean and the standard deviation of this distribution.

$\mu = 2$
 $\sigma = 1.49$

- b. Remember that the size of the standard deviation is related to the size of the deviations from the mean. Explain why the standard deviation of this distribution is greater than the standard deviation in Exercise 2.

2 dots moved from the middle to the edges (normal \rightarrow deviant)

4. Suppose that all ten people questioned answered all four questions on the questionnaire.
- a. What would the dot plot look like?



- b. What is the mean number of questions answered? (You should be able to answer without doing any calculations!)

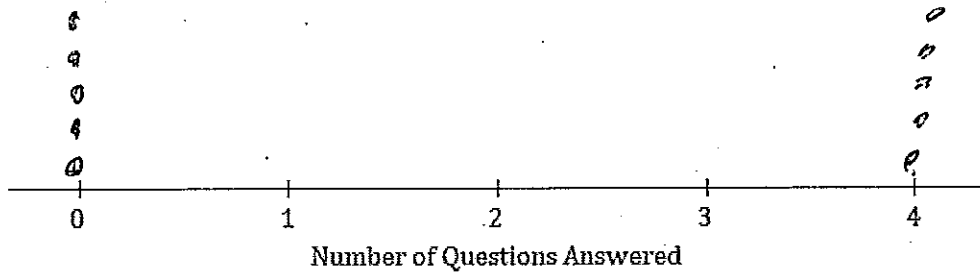
4

- c. What is the standard deviation? (Again, don't do any calculations!)

0! Nobody deviates.

5. Continue to think about the situation previously described where the numbers of questions answered by each of ten people was recorded.

- a. Draw the dot plot of the distribution of possible data values that has the largest possible standard deviation. (There were ten people at the talk, so there should be ten dots in your dot plot.) Use the scale given below.



- b. Explain why the distribution you have drawn has a larger standard deviation than the distribution in Exercise 4.

Every dot is deviant. No dot is in the middle.
 $\sigma = 5.27$