

**Standard Deviation Introduction**  
Statistics – Algebra 1

Name:

Answers

Let's talk more about **standard deviation**. Remember: It's a tool that helps us figure out how spread out or varied a distribution of data is. Try these problems.

1) Use a calculator to find the mean and standard deviation for the following set of data. A set of eight men had heights (in inches) as shown below. Indicate the mean and standard deviation you obtained from your calculator to the nearest hundredth.

67.0 70.9 67.6 69.8 69.7 70.9 68.7 67.2

Mean: 68.98

Standard Deviation: 1.48  
 $\sigma x$

2) The heights (in inches) of 9 women were as shown below. Use your calculator to find the mean and the standard deviation of these heights to the nearest hundredth.

68.4 70.9 67.4 67.7 67.1 69.2 66.0 70.3 67.6

Mean: 68.29

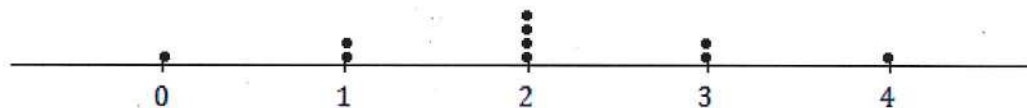
Standard Deviation: 1.49

3) Look at the means and the standard deviations from the two sets of data above. Which set of data is more spread out? How do you know?

The data in #2 is slightly more spread out since the S.D. is a bit larger.

4) Ten people attended a talk at a conference. At the end of the talk, 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.



Number of Questions Answered

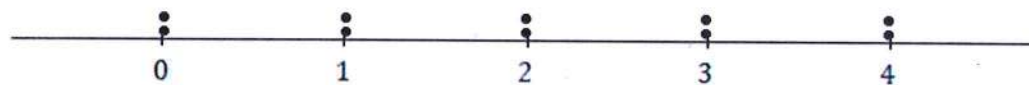
0, 1, 1, 2, 2, 2, 2, 3, 3, 4

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

Mean: 2

Standard Deviation: 1.15

5) Suppose the dot plot looked like this:



0, 0, 1, 1, 2, 2, 3, 3, 4, 4

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

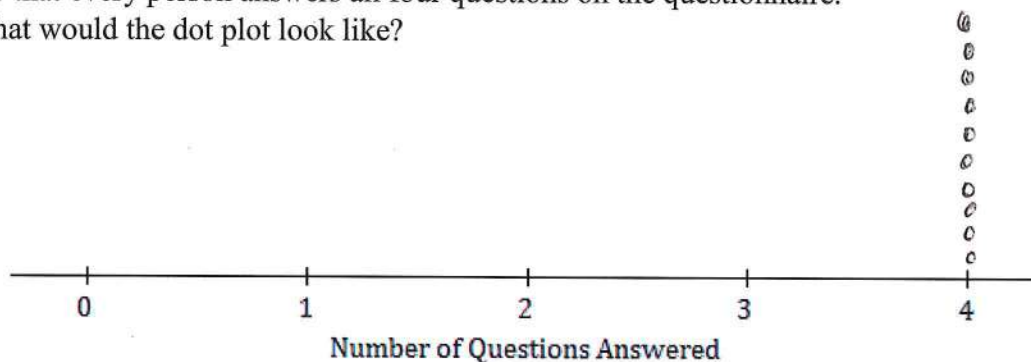
$$\bar{x} = 2 \quad \sigma x = 1.10$$

- 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 problem #4.

The S.D. is larger in this data since the data is more spread out.

- 6) Suppose that every person answers all four questions on the questionnaire.

- a. What would the dot plot look like?



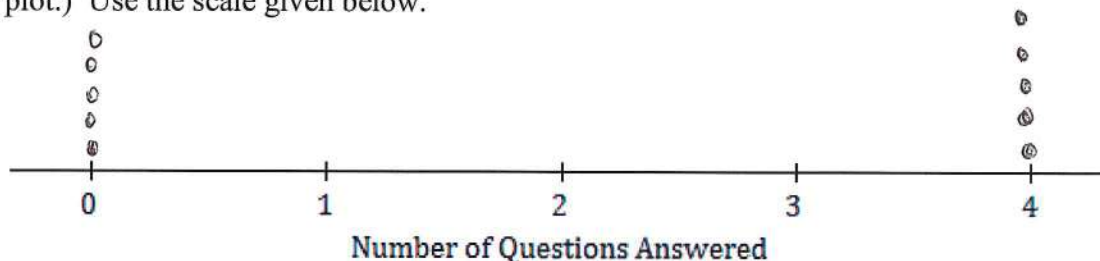
- b. What is the mean number of questions answered? (You should be able to answer without doing any calculations!)

$$\bar{x} = 4$$

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

$$\sigma x = 0$$

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



$$\bar{x} = 2 \quad \sigma x = 2$$