

Name: Key

Date: _____

**VARIATION WITHIN A DATA SET
COMMON CORE ALGEBRA I HOMEWORK**

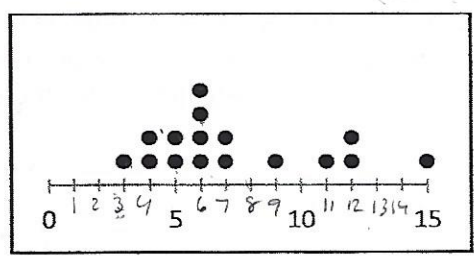
1. For each of the following data sets, use your calculator to help find the interquartile range and the population standard deviation. Show your calculation for the IQR. Round all non-integer values to the nearest *tenth*.

(a) 4, 6, 8, 10, 15, 19, 22, 25
 $IQR: 20.5 - 7 = 13.5$
 $\sigma_x: 7.3$

(b) 3, 3, 4, 5, 5, 6, 6, 7, 7, 8
 $IQR: 7 - 4 = 3$
 $\sigma_x: 1.6$

2. For the data set shown in the dot plot below, which of the following is closest to its population standard deviation?

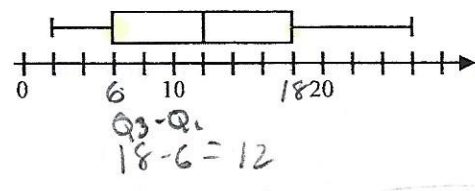
- (1) 2.7
- (2) 4.2
- (3) 3.3
- (4) 5.8



σ_x
 1 | 1 Frequency
 3 | 1 must put
 4 | 2 $L_2 \rightarrow [2nd] [2]$
 5 | 2 into Freq List
 6 | 4 which is under
 7 | 2 STAT CALC
 9 | 1
 11 | 1
 12 | 2
 15 | 1

3. What is the interquartile range of the data set represented in the box plot shown below?

- (1) 24
- (2) 14
- (3) 8
- (4) 12



4. Which of the following best measures the average distance that a data value lies away from the mean?

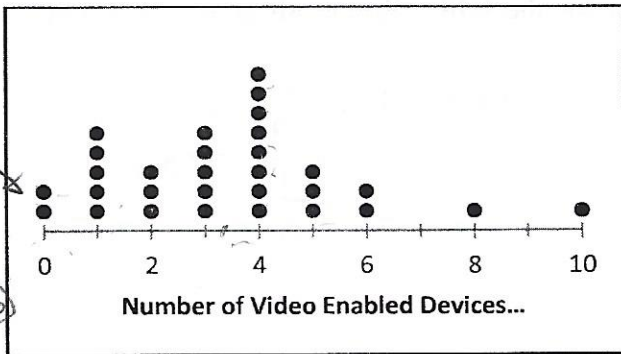
- (1) mean
- (2) standard deviation
- (3) median
- (4) range

5. Which of the following data sets would have the largest standard deviation?

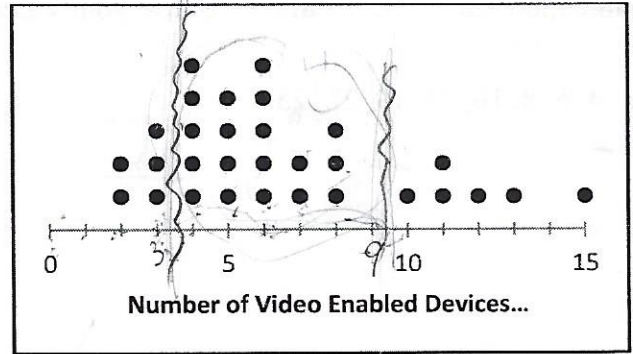
- (1) {3, 3, 4, 5, 5} .894
- (2) {72, 73, 74, 75, 76} 1.41
- (3) {2, 8, 18, 26, 35} 11.91
- (4) {8, 10, 12, 14, 16} 2.82

use population σ_x

6. We are going to revisit our survey of households that have video enabled devices (televisions, smart phones, tablets, etcetera). Recall that two surveys were done, each with 30 participants. In the first case (Survey A) the survey was random, in the second case (Survey B), the survey only included families with at least teenager. The dot plots of the results are shown below.



Survey A



Survey B

pot #'s
input
STAT
CALC
1: 1-Var Stats
to get
answers

- (a) Enter the data into your calculator and use it to calculate the mean number of devices, the interquartile range, and the standard deviation of both data sets. Round all non-integers to the nearest tenth. Remember, you will have to enter a given data point more than once. For example, in Survey A, you will need to enter 2-0's, 5-1's, 3-2's, etcetera. Use the sample standard deviation.

Survey A Statistics:

$$\begin{aligned} \bar{x}: \text{mean} &= 3.4 \\ q_3 - q_1, \text{IQR} &= 4 - 2 = 2 \\ s_x &= 2.3 \end{aligned}$$

Survey B Statistics:

$$\begin{aligned} \bar{x}: \text{mean} &= 6.4 \\ q_3 - q_1, \text{IQR} &= 8 - 4 = 4 \\ s_x &= 3.3 \end{aligned}$$

- (b) Which of these two survey data sets had the greatest variation in the data? Explain based on the statistics you found in part (a).

Survey B had the greatest variation in the data. It had the larger standard deviation b/c the #'s are more spread out

- (c) How many of the 30 values in Survey B fall within one standard deviation of the mean. To do this calculation, add the standard deviation and subtract the standard deviation from the mean and then count the number of values between the results of this addition and subtraction.

$$\begin{array}{r} 6.4 \rightarrow \text{mean} \\ - 3.3 \rightarrow \text{SD} \\ \hline 3.1 \end{array} \quad \begin{array}{r} 6.4 \rightarrow \text{mean} \\ + 3.3 \rightarrow \text{SD} \\ \hline 9.7 \end{array}$$

from 3.1 \rightarrow 9.7 there are **19** values