

Name: Key

Class: \_\_\_\_\_

AU5: HW #2 – Standard Deviation

Date: \_\_\_\_\_

1. Use the statistical features of your calculator to find the standard deviation to the nearest tenth of a data set of the miles per gallon from a sample of 5 cars.

24.9, 24.7, 24.7, 23.4, 27.9

Mean: 25.12

Standard Deviation: 1.66

2. Twenty-five people were attending an event. The ages of the people are indicated below:

3, 3, 4, 4, 4, 4, 5, 6, 6, 6, 6, 6, 6, 6, 7, 7, 7, 7, 7, 7, 16, 17, 22, 22, 25

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

Mean: 8.52

Standard Deviation: 6.38

3. Suppose that a teacher plans to give four students a quiz. The minimum possible score on the quiz is 0 and the maximum possible score is 10.

a. What is the smallest possible standard deviation of the students' scores? Give an example of a possible set of four student scores that would have this standard deviation.

0

all students scored a 7.

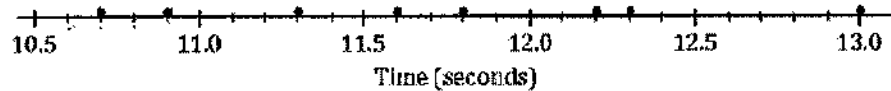
b. What is the set of four student scores that would make the standard deviation as large as it could possibly be? Use your calculator to find this largest possible standard deviation.

0, 0, 4, 4

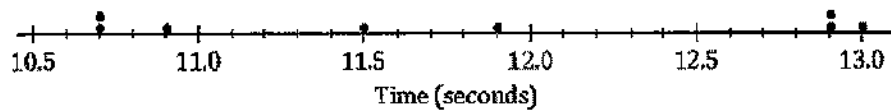
$S_x \approx 2.31$

4. At a track meet there were three men's 100m races. The sprinters' times were recorded to the nearest  $\frac{1}{10}$  of a second. The results of the three races are shown in the dot plots below.

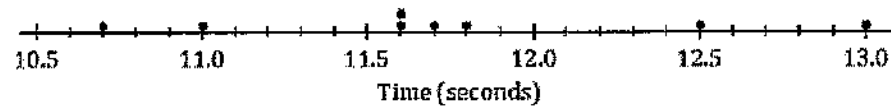
Race 1



Race 2



Race 3



- a. Remember that the size of the standard deviation is related to the sizes of the deviations from the mean. Without doing any calculations, rank the three races from smallest to largest standard deviation of times. Justify your answer.

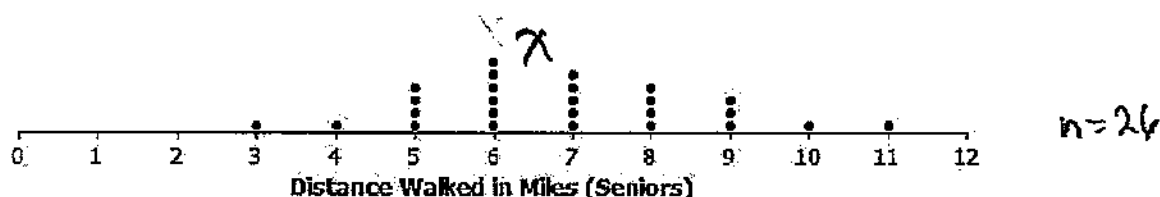
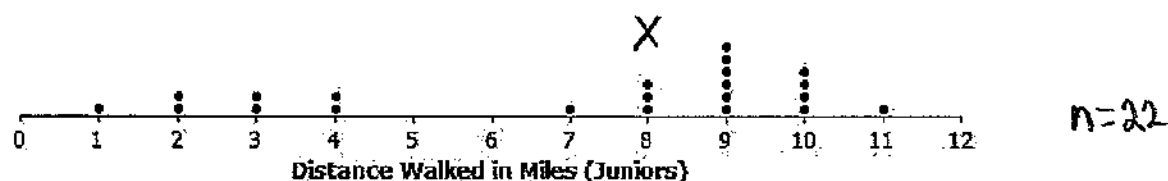
Race 3, Race 1, Race 2  
 ↑ data is distributed close to the mean (low  $s_x$ )  
 ↑ data is uniformly distributed (mid  $s_x$ )  
 ↑ data is clustered to the extremes (high  $s_x$ )

- b. Use your calculator to find the mean and the standard deviation for each of the three races. Write your answers in the table below to the nearest thousandth.

	Mean	Standard Deviation
Race 1	11.725	.767
Race 2	11.813	1.01
Race 3	11.557	.580

**Spiral:**

5. Twenty-two students from the junior class and twenty-six students from the senior class at River City High School participated in a walkathon to raise money for the school's band. Dot plots indicating the distances in miles students from each class walked are shown below:



a) Estimate the mean number of miles walked by a junior and mark it with an "X" on the junior class dot plot. How did you estimate this position? Repeat the same steps for seniors. Juniors  $\approx 8$ , The data is skewed with the tail to the left so the  $\bar{x}$  will be pulled down.

Seniors  $\approx 6$  or  $7$  The data is rather symmetrical.

b) What is the median of the junior data distribution? Senior distribution?

Junior med = 8.5

Senior

c) Is the mean number of miles walked by a junior approximately equal to, or different than the median number of miles? Explain. How about the seniors?

Junior  $\bar{x} = 7.04$  vs. med. 8.5 is quite different

Seniors  $\bar{x} = 6.85$  vs med. 7 is approximately equal.

d) Would the mean or the median be better to describe the typical number of miles walked by a junior in this walkathon? How about the seniors?

For Juniors, the median b/c the data is skewed.

For Seniors, they are both good.

