

Statistical Reasoning Standard Deviation

Name: Key

Date: _____

Class: _____

Definitions Review - Write the formula and explain how to find each of the following statistical measures.

MEAN \bar{x} average $\frac{\text{sum of } n}{n}$	MEDIAN middle # when in order	MODE # that occurs most often	RANGE max - min
VARIANCE (st. dev) ²	STANDARD DEVIATION avg. distance from mean $\sigma = \sqrt{\text{var.}}$	INTERQUARTILE RANGE Q3 - Q1	

For each of the following problems, compute each of the 7 statistical measures.

2. A group of seven students from Mr. H's 1st block class was randomly selected and asked to indicate the number of study hours each put in before taking a major exam. The data are as follows:

Mean $\bar{x} = 2.71$

Median 3

Mode 3 and 1

Range 5 - 1 = 4

Variance 1.93

Std. Dev. $\sigma = 1.39$

IQR 4 - 1 = 3

variance = (std. dev)²

Student	Hours of Study
1	4
2	3
3	3
4	5
5	1
6	1
7	2

3. A group of seven students from Mr. H's 2nd block class was randomly selected and asked to indicate the number of study hours each put in before taking a major exam. The data are as follows:

Mean 2

Median 3

Mode 1 and 3

Range 4 - 0 = 4

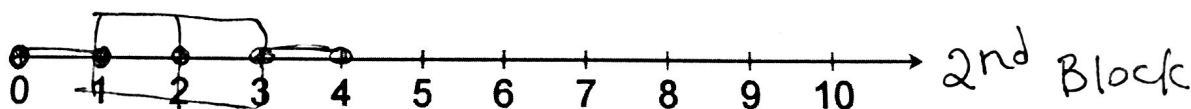
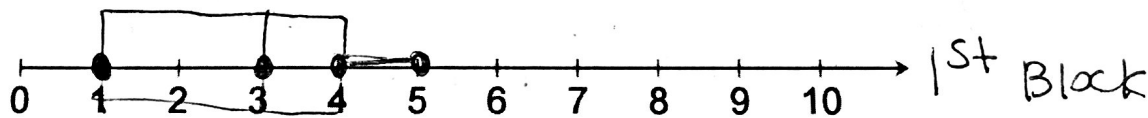
Variance 1.72

Std. Dev. 1.31

IQR 3 - 1 = 2

Student	Hours of Study
1	2
2	0
3	1
4	3
5	1
6	3
7	4

Make a comparative box and whisker plot for the 2 classes.



Which class studies harder?

1st Block

4. The GPA of the seven selected students from Mr. H's 1st block are as follows:

Mean 2.71
 Median 3
 Mode 3.00
 Range $\frac{3.75}{-1.75} = 2$
 Variance .45
 Std. Dev. 0.67
 IQR $3.25 - 2 = 1.25$

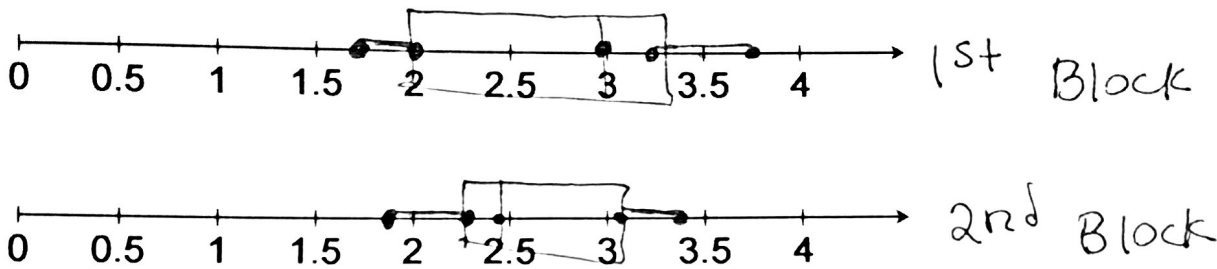
Student	GPA
1	3.75
2	3.00 -
3	3.25
4	1.75
5	2.00
6	2.25
7	3.00 -

5. The GPA of the seven selected students from Mr. H's 2nd block are as follows:

Mean 2.57
 Median 2.4
 Mode 2.25
 Range $\frac{3.3}{-1.9} = 1.4$
 Variance 0.23
 Std. Dev. 0.48
 IQR $3.15 - 2.25 = 0.9$

Student	GPA
1	2.75
2	3.15
3	3.30
4	1.90
5	2.25 ~
6	2.25 ~
7	2.40

Make a comparative box and whisker plot for the 2 classes.



Which class studies harder?

6. A researcher investigating a new product for clearing up acne selects a random sample of 10 teenagers, gives them the facial product to use and asks them to report back how many days it took for the facial condition to clear up.

The results (in days) were as follows: 20, 8, 10, 14, 15, 14, 12, 11, 14, 13

Mean 13.1 Median 13.5 Mode 14 Range $20 - 8 = 12$
 Variance 9.49 Std. Dev $\sigma = 3.08$ IQR $14 - 11 = 3$

7. A clinical psychologist is interested in assessing the prevalence of MDD (Major Depressive Disorders) among a group of fourth-grade students. A random sample of 13 students was selected and given the Children's Depression Inventory (CDI), a self-report instrument that measures level of depression. Scores above 13 are said to indicate a major depressive disorder.

The scores were as follows: 8, 10, 11, 7, 13, 4, 8, 7, 9, 3, 15, 10, 10

Mean 8.85 Median 9 Mode 10 Range $15 - 3 = 12$
 Variance 9.99 Std. Dev $\sigma = 3.16$ IQR $10.5 - 7 = 3.5$