Wednesday, August 22, 2018

- **Warm-up**
  - **Find the mode, ~~mean~~, median, quartile 1 and quartile 3 for the following salaries:** No calculator ☹
- **Check Homework**
- **Examine measures of spread**
- **Examine measures of center**

Objectives:

Content: I will be able to compute and explain various measures of center and spread including mean, median, quartiles, range, IQR, and standard deviation.

Social: I will discuss ideas with my group and try to involve everyone.

Language: I will defend my decision verbally within my group.

$20,428,571
$11,750,000
$8,000,000
$8,000,000
$7,300,000
$6,000,000
$5,900,000
$4,800,000
$4,400,000
$4,000,000
$3,750,000
$3,175,000
$2,100,000
$1,500,000
$1,100,000
$545,000
$545,000
$540,000

Warm-up

- Find the mode, mean, median, quartile 1 and quartile 3 for the following salaries:

mode => most occuring

$8 million, $545,000

mean => "average" → $\frac{\sum x}{n}$ 4,200,000

median => middle - when numbers are in order

50th percentile Q2

Quartile 1 => Q1 } medians of halves

25th percentile

Q3 => 75th percentile

$20,428,571
$11,750,000
$8,000,000
$8,000,000
Q3 $7,300,000
$6,000,000
$5,900,000
$4,800,000
$4,400,000
$4,000,000
$3,750,000
$3,175,000
$2,100,000
Q1 $1,500,000
$1,100,000
$545,000
$545,000
$540,000

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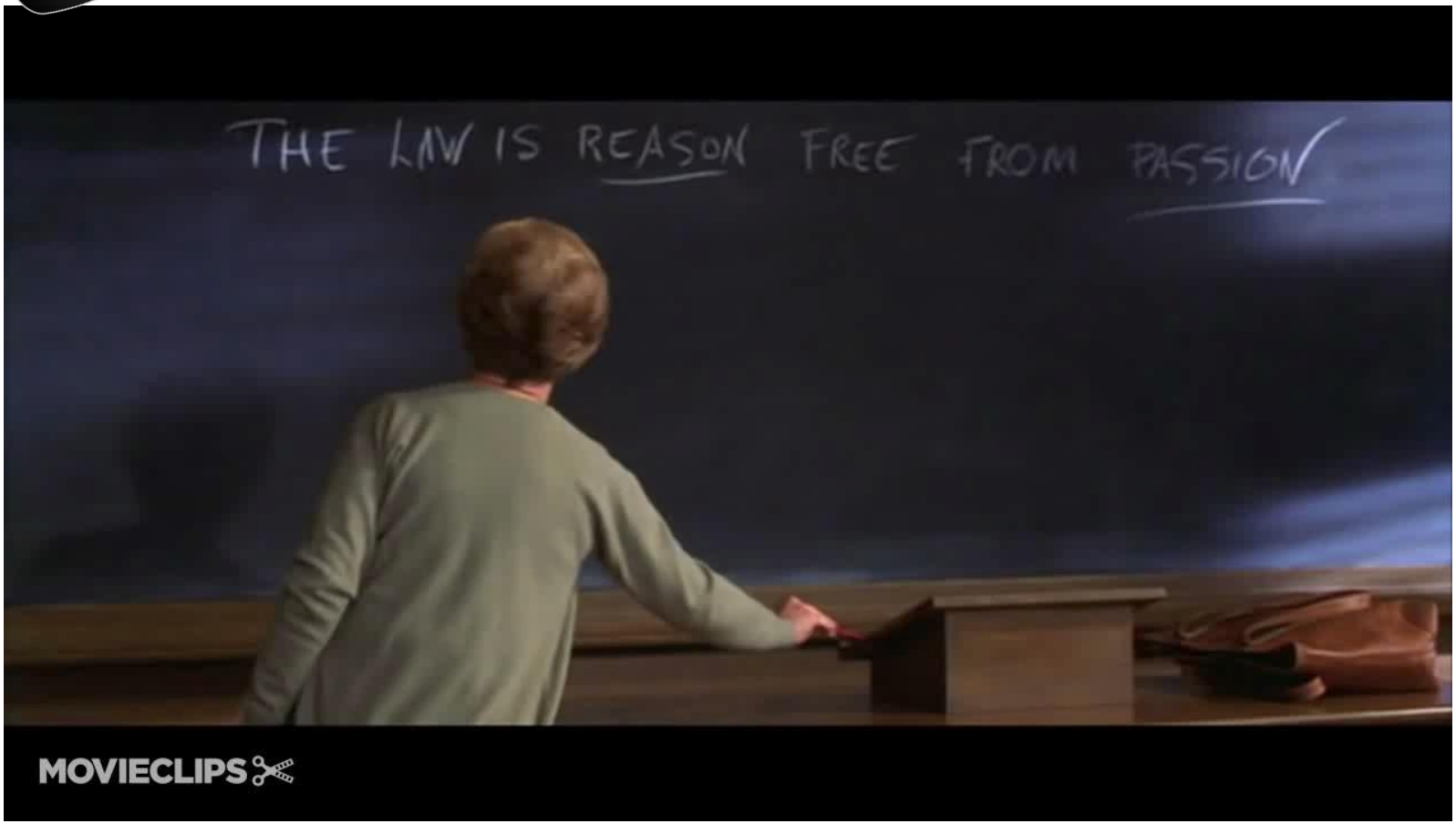
In colleges, students rate professors

On a scale from 1-100, how would you rate this one?



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You are trying to choose a professor. Whom do you choose? Why?

Ratings for Professor I	Ratings for Professor Q
65	42
66	54
67	58
68	62
71	67
73	77
74	77
77	85
77	93
77	100

$(65-71.5)^2$
$+$
$(66-71.5)^2$
$+$
$(67-71.5)^2$

$\div$ 10-1

mean = 71.5
median = 72
mode = 77

mean = 71.5
median = 72
mode = 77

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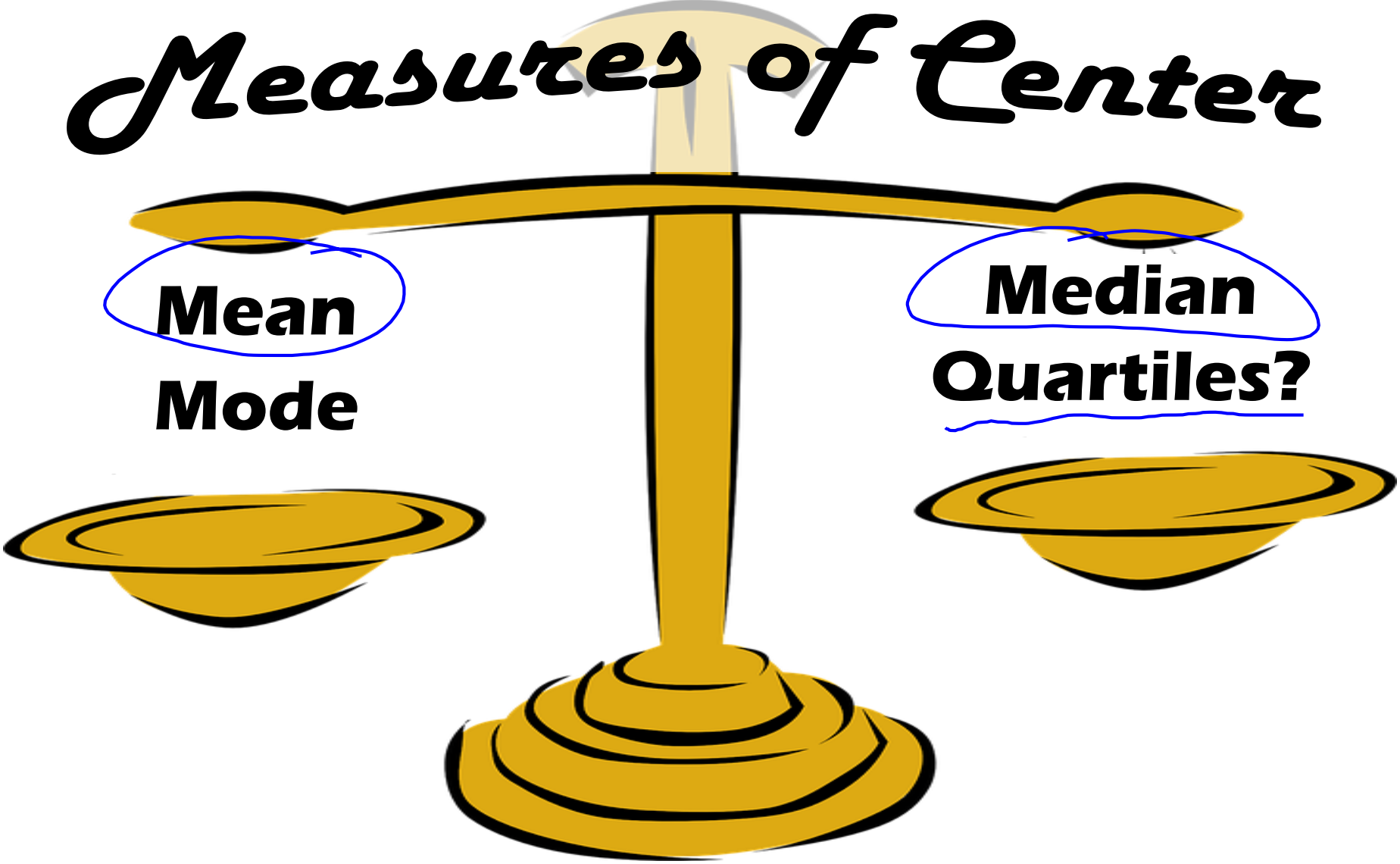
Measures of Center



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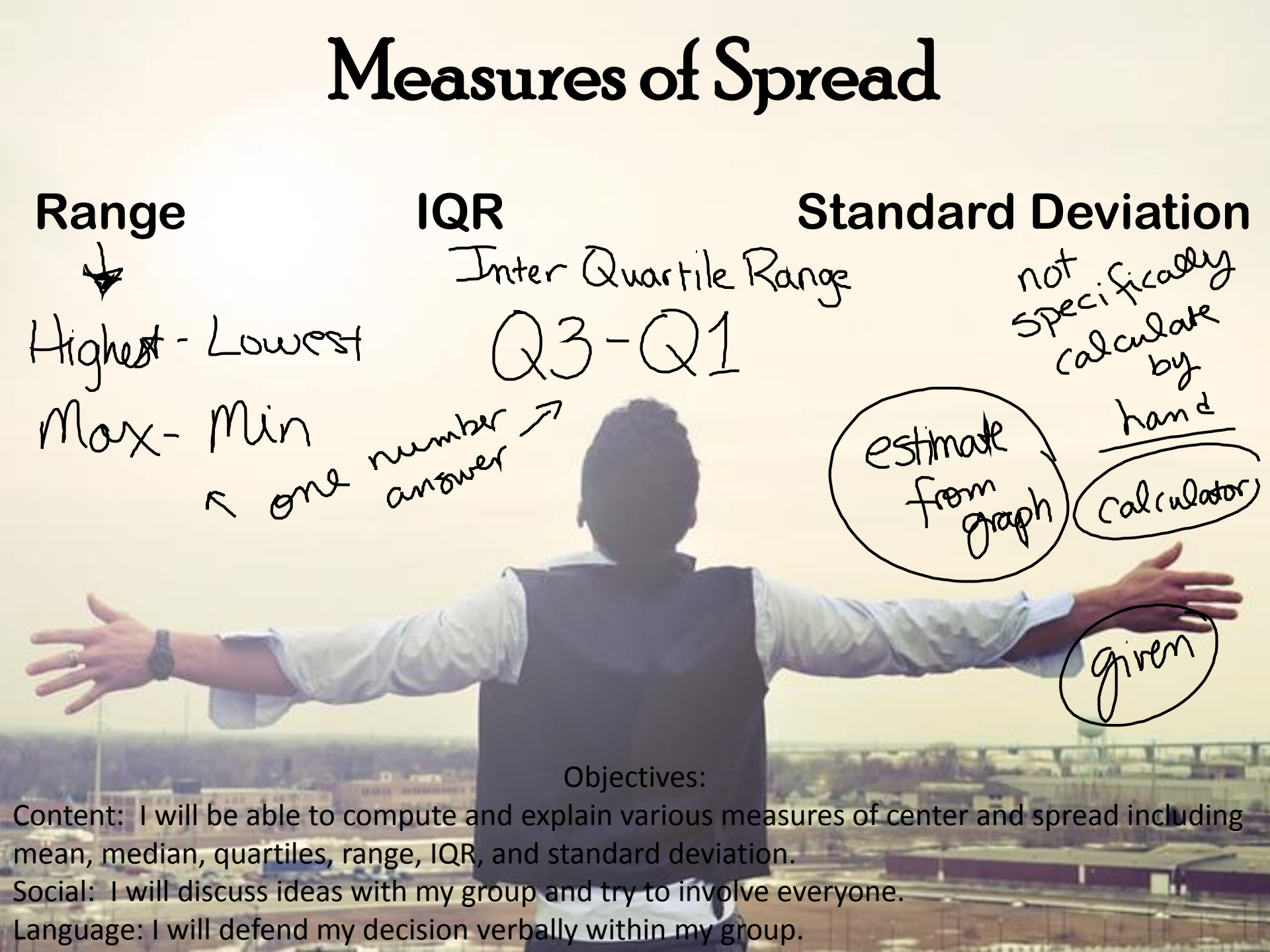
Measures of Spread



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How to calculate standard deviation

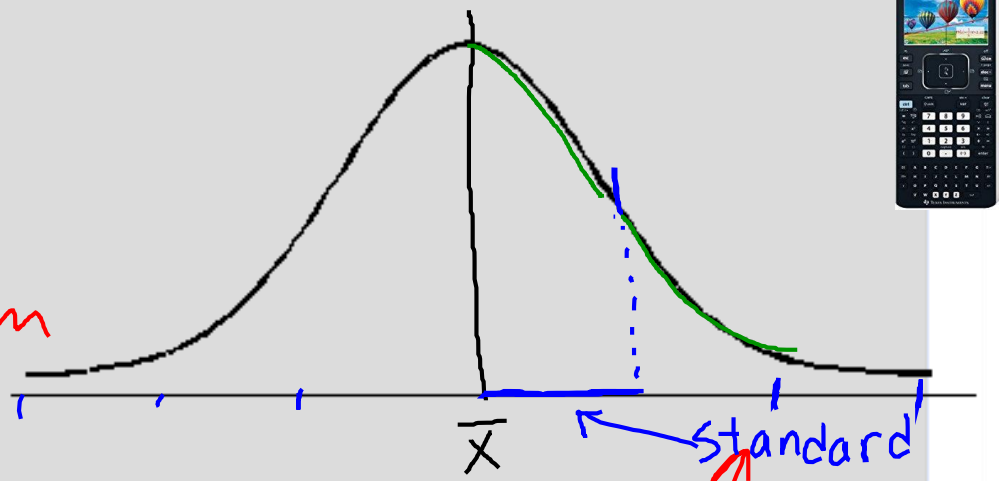
$$S_x = \sqrt{\frac{1}{n-1}\Sigma(x_i - \overline{x})^2}$$

sum

quantity of data

individual value

mean



$\overline{x}$ = mean

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Connecting measures of spread with measures of center

Objectives:

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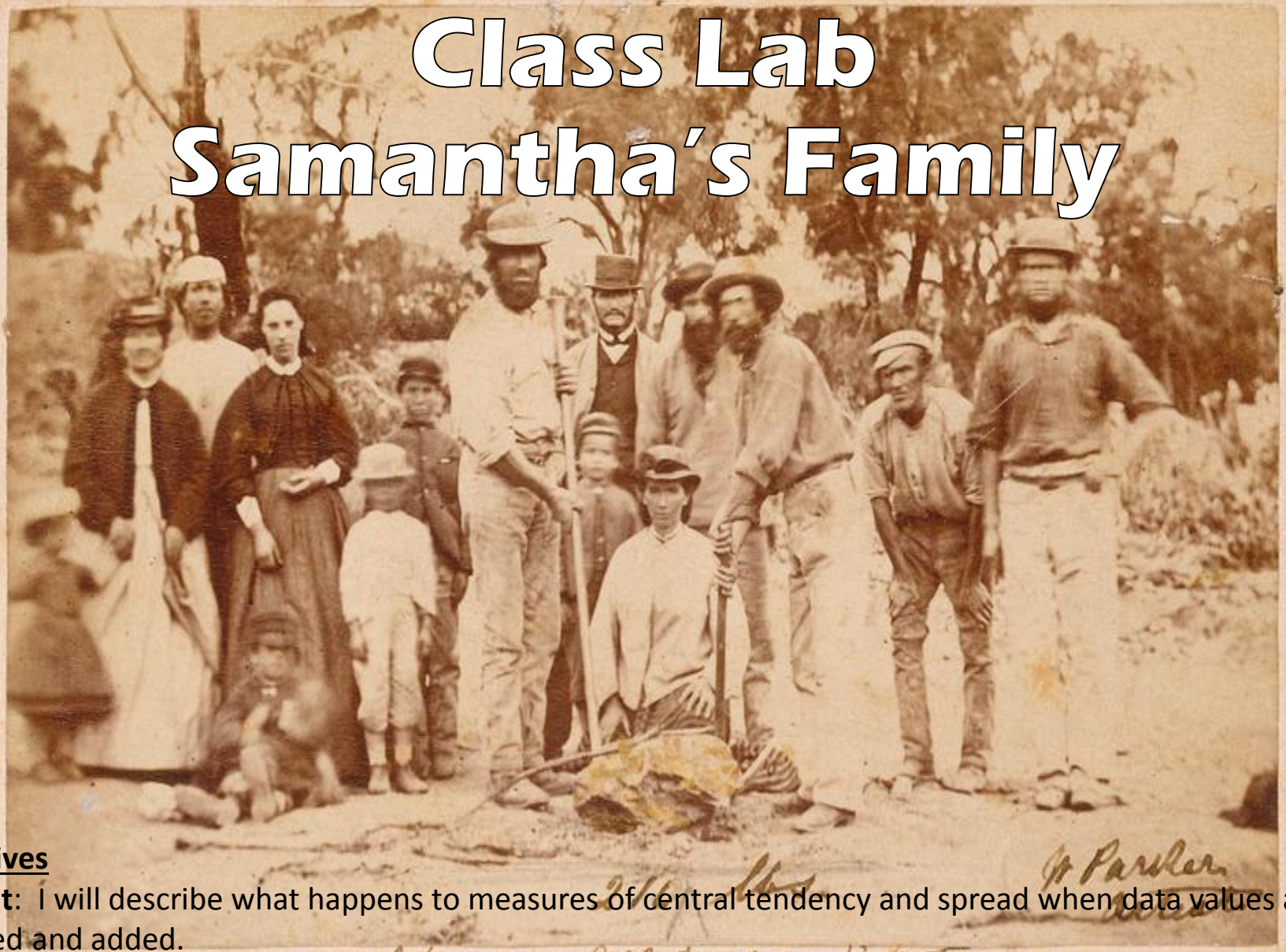
Class Lab
Samantha's Family



Objectives

Content: I will describe what happens to measures of central tendency and spread when data values are removed and added.

Social: I will interact with the class activity.

Language: I will both verbally discuss and in writing conclude the effects of removing and adding data points to measures of central tendency.

Scenario 1

A. Predict how the median age and mean age for those family members will change from the previous scenario.
B. Predict how the range, IQR, and standard deviation will change from the previous scenarios.

- Samantha's family consists of Rasheed (14), Mother (42), Father (44), Linda (17) and Samatha herself (11).

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Essential Question: How are measures of central tendency affected by removing and adding data points?

Scenario 2

A. Predict how the median age and mean age for those family members will change from the previous scenario.
B. Predict how the range, IQR, and standard deviation will change from the previous scenarios.

- Father leaves to go on a month-long trip and Grandpa James, who is 68 years old, moves in to help take care of the family for that month.

Objectives

Content: I will describe what happens to measures of central tendency and spread when data values are removed and added.

Social: I will interact with the class activity.

Language: I will both verbally discuss and in writing conclude the effects of removing and adding data points to measures of central tendency.

Essential Question: How are measures of central tendency affected by removing and adding data points?

Scenario 3

A. Predict how the median age and mean age for those family members will change from the previous scenario.
B. Predict how the range, IQR, and standard deviation will change from the previous scenarios.

- Father returns home. Grandpa James leaves. Mom's sister Liz takes Samantha away to camp, but leavers her daughter Elisa (1). Mother, Father, Rasheed, Linda, and Elisa are at the house.

Objectives

Content: I will describe what happens to measures of central tendency and spread when data values are removed and added.

Social: I will interact with the class activity.

Language: I will both verbally discuss and in writing conclude the effects of removing and adding data points to measures of central tendency.

Essential Question: How are measures of central tendency affected by removing and adding data points?

Scenario 4

A. Predict how the median age and mean age for those family members will change from the previous scenario.
B. Predict how the range, IQR, and standard deviation will change from the previous scenarios.

- Samantha comes home from camp and Elisa leaves. Linda graduates from high school and leaves for college. Their younger cousin Kevin, who is 8 years old, moves in.

Objectives

Content: I will describe what happens to measures of central tendency and spread when data values are removed and added.

Social: I will interact with the class activity.

Language: I will both verbally discuss and in writing conclude the effects of removing and adding data points to measures of central tendency.

Essential Question: How are measures of central tendency affected by removing and adding data points?

Scenario 5

A. Predict how the median age and mean age for those family members will change from the previous scenario.
B. Predict how the range, IQR, and standard deviation will change from the previous scenarios.

- Great-Grandpa Charlie (94) needs to live with a family, so he comes to live at Samantha's house. Mom goes away on a business trip.

Objectives

Content: I will describe what happens to measures of central tendency and spread when data values are removed and added.

Social: I will interact with the class activity.

Language: I will both verbally discuss and in writing conclude the effects of removing and adding data points to measures of central tendency.

Essential Question: How are measures of central tendency affected by removing and adding data points?

Scenario 6

A. Predict how the median age and mean age for those family members will change from the previous scenario.
B. Predict how the range, IQR, and standard deviation will change from the previous scenarios.

- Twin cousins Amanda and Keesha, who are 12, need a place to live. Mom comes home from her trip. There are too many girls so Kevin and Great-Grandpa Charlie leave.

Objectives

Content: I will describe what happens to measures of central tendency and spread when data values are removed and added.

Social: I will interact with the class activity.

Language: I will both verbally discuss and in writing conclude the effects of removing and adding data points to measures of central tendency.

Essential Question: How are measures of central tendency affected by removing and adding data points?

Resistant to extremes?

(outliers)

moves the way of the extremes

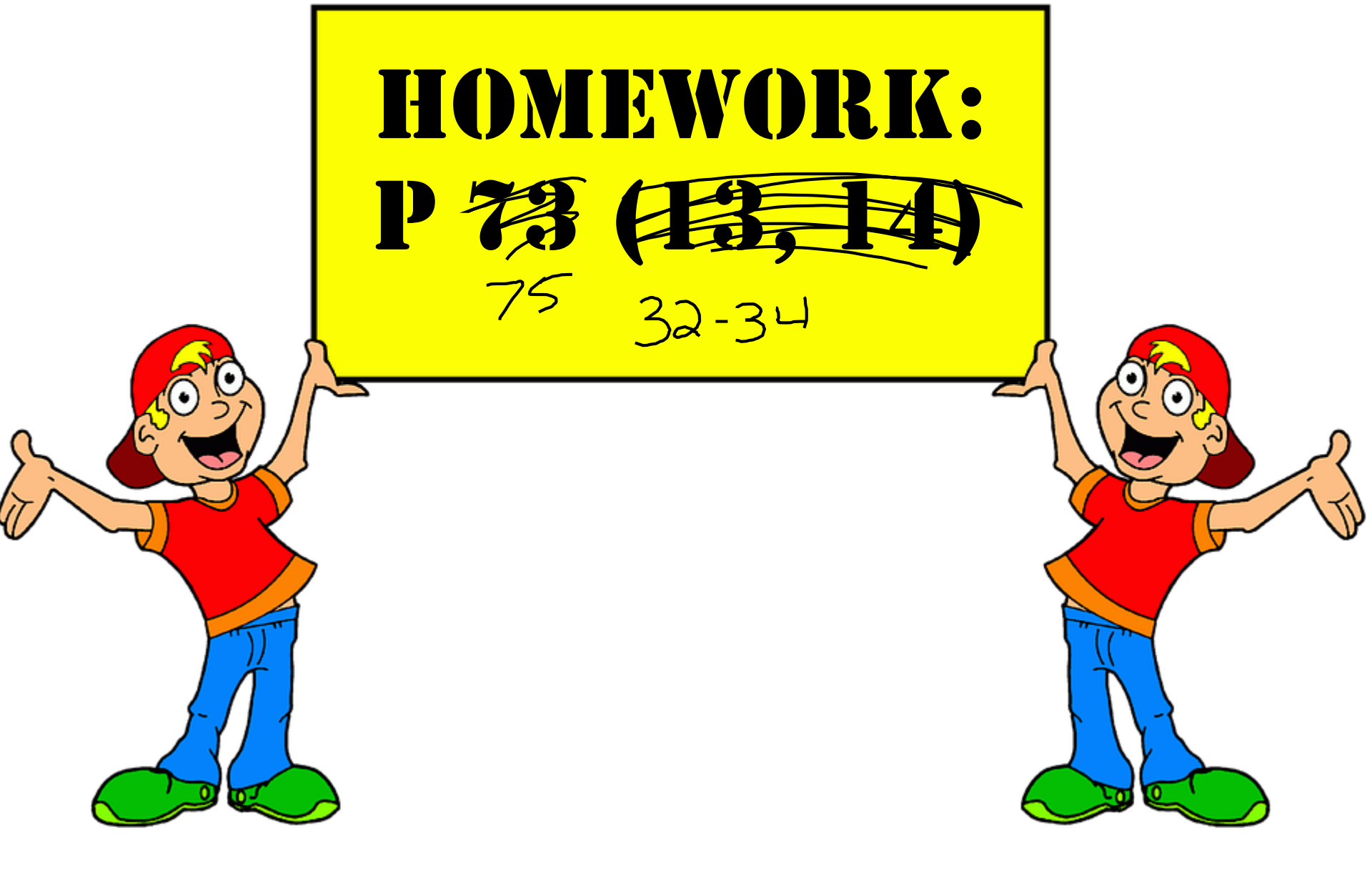
mean – not resistant to extremes

Standard deviation

range

median – resistant to extremes

IQR


HOMEWORK:
P 73 (13, 14)
75
32-34

Exit Slip

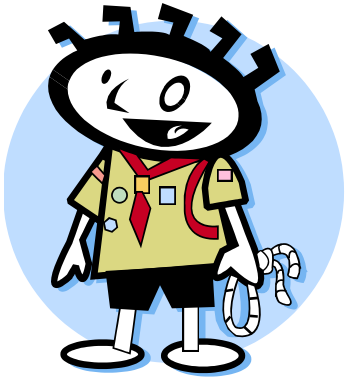
When a measure of center is affected by extreme values in the data, it is called a nonresistant measure of center. A resistant measure of center is not affected by changes to the largest and smallest values in the data. Based on your answer to the scenarios, which measure of center is resistant? Explain your reasoning.

Samantha

Age 11

Rasheed

Age 14



Mother

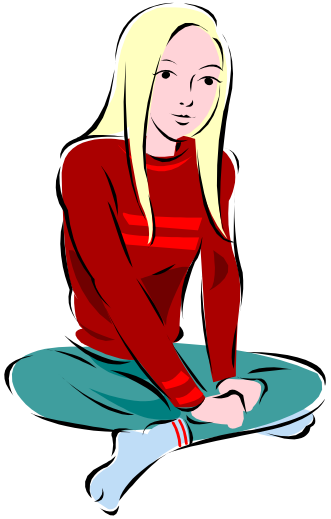
Age 42

Father

Age 44

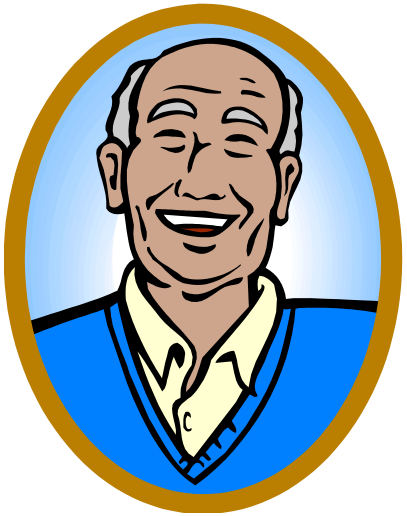
Linda

Age 17



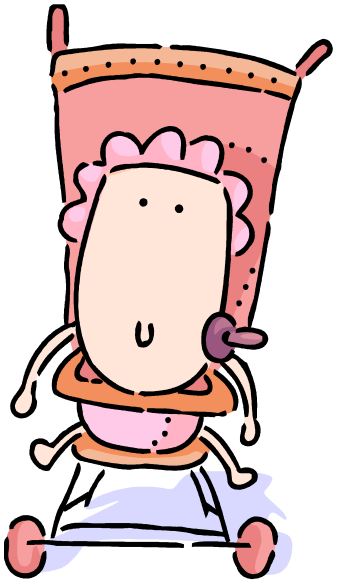
Grandpa James

Age 68



Cousin Elisa

Age 1



Cousin Kevin

Age 8

Great Grandpa Charlie

Age 94

Cousin Amanda

Age 12

Cousin Keesha

Age 12

MEDIAN

MEAN