

## Statistics Practice Quiz for the Sinclair Exam 1

1 – Use the two-way table to answer the questions below:

A survey was performed comparing the favorite activities of men and women.

	Dance	Sports	TV	Total
Men	2	10	8	
Women	16	6	8	
Total				

- How many men were surveyed?
- How many people prefer TV?
- How many men said sports was their favorite activity?
- What percent of people surveyed prefer dance?
- What percent of people were women?
- What percent of men prefer sports?
- What percent of people preferring sports are women?

2 – Use the two-way table to answer the questions below:

A survey was performed comparing the favorite music of students in grade 9 and 10.

Extra info: 25% of those surveyed were in grade 9. Half of 10<sup>th</sup> graders prefer country. No 9<sup>th</sup> graders prefer R&B.

	R&B	Rock	Country	Total
Grade 9			6	
Grade 10		10		
Total				80

- Complete the table.
- What percent of people surveyed prefer R&B?
- What percent of 10<sup>th</sup> graders prefer R&B?
- What percent people preferring Rock are in grade 9?

A random sample of 200 teenagers participated in a taste test. Each teenager sampled four choices of fruit drink (labeled "A", "B", "C", and "D"), and then were asked to pick a favorite. The table shows the results of this taste test.

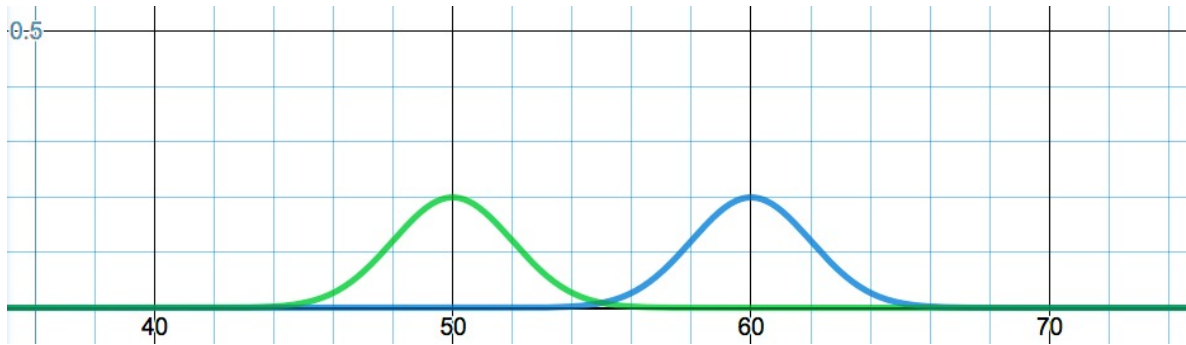
	A	B	C	D	Total
Boys	45	25	30	20	120
Girls	25	10	30	15	80
Total	70	35	60	35	200

Based on the information given, which of the given statements are true?

Select **all** that apply.

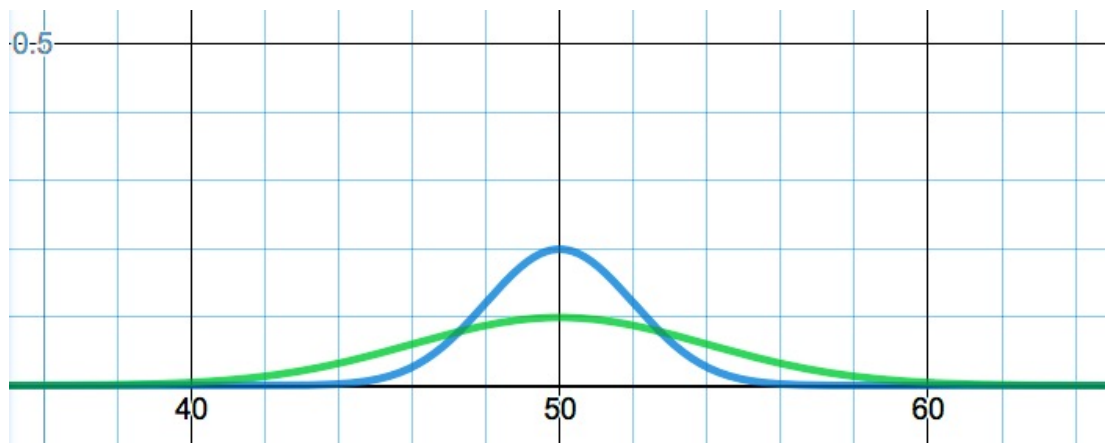
- A. 40% of the participants were girls.
- B. 70% of the participants preferred "A".
- C.  $\frac{20}{120}$  of the boys preferred "D".
- D.  $\frac{10}{35}$  of the participants who preferred "B" were girls.
- E. The proportion of boys who preferred "C" is equal to the proportion of girls who preferred "C".

5 – The heights of elementary students is found to be normally distributed for each grade. The graphs of the 2<sup>nd</sup> grader students and 5<sup>th</sup> grade students is shown below. Unit: inches.



- a. Which graph represents each grade?
- b. What is the mean height for each grade?
- c. True or false: The median height for 5<sup>th</sup> graders is equal to the mean height of 5<sup>th</sup> graders.
- d. The claim is made that the distribution is more variable for 3<sup>rd</sup> graders than 5<sup>th</sup> graders. Based on the graph do you agree with this claim?
- e. True or false: half of the 2<sup>nd</sup> graders are shorter than 50 inches.
- f. True or false: all 5<sup>th</sup> graders are taller than all 2<sup>nd</sup> graders.

6 – Use the following graph to state if the claims below are true.



- Both graphs are symmetric
- The means of the graphs are the same
- The variation of the graphs are the same
- A value is selected from the data used to create the tall graph. This data point is equally likely to be greater than 50 as it is to be less than 50.

7 – The box plot below shows the number of sick days taken by employees during the last year.

Use the box plot to answer the following questions:



- What is the range?
- What is the median?
- What is the interquartile range?
- In order to be in the lowest 25%, a value must be below what number?
- In order to be in the lowest 75%, a value must be below what number?
- What percent is between 3 and 8?
- If the company employs a total of 60 workers, then how many people missed fewer than 3 days?



10 – Use the histogram below to answer the questions below:

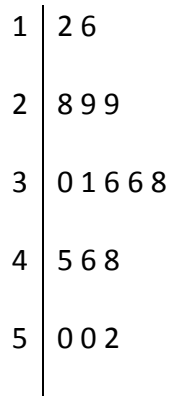
Value	<input type="checkbox"/>	1	2	3	4	5
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Show the data used to create the plot.
- Find the median.
- Find the mean.
- Find the range.
- Find the interquartile range.
- What percent of the data values are less than 7?
- How many values are greater than 7?

11.

- Protecting wood** How can we help wood surfaces resist weathering, especially when restoring historic wooden buildings? In a study of this question, researchers prepared wooden panels and then exposed them to the weather. Here are some of the variables recorded: type of wood (yellow poplar, pine, cedar); type of water repellent (solvent-based, water-based); paint thickness (millimeters); paint color (white, gray, light blue); weathering time (months). Identify each variable as categorical or quantitative.

12. Use the stem and leaf plot below to answer the questions given than  $4|3 = 43\%$



Min =

Q1 =

Med =

Q3 =

Max =

Range =

How many scores are above 40%?

IQR =

Mean =

What percent of scores are less than 30?

St. Dev =

13 The mean age of people living in a neighborhood is 50 with standard deviation 6.

- a) What percent is over age 40?
- b) What percent is between age 46 and 54?
- c) What age places you in the top 10% on the block?
- d) Find the IQR

14 Bill takes AP Stats. His grade is an 88% the class has an average grade of 90% with st. dev. = 4%.

John takes CCP Stats. His grade is an 84% the class has an average grade of 86% with st. dev. = 10%.

Who has the better grade?

15 Betty analyzed the study time and quiz score of her stats class on the last quiz. Identify the explanatory and response variable.

16 The correlation between the response variable mood (1-10) based on the explanatory variable internet speed (MBps) is  $r = .6$ .

- a) Describe the meaning of  $r = .6$
- b) If the response and explanatory variables are reversed, how is  $r$  affected?
- c) The internet speed in MBps can be converted to BPS by multiplying by 1,000,000. What is the correlation after converting internet speed to BPS?

## Statistics Practice Quiz for the Sinclair Exam 1

1 – Use the two-way table to answer the questions below:

A survey was performed comparing the favorite activities of men and women.

	Dance	Sports	TV	Total
Men	2	10	8	20
Women	16	6	8	30
Total	18	16	16	50

- a. How many men were surveyed? 20
- b. How many people prefer TV? 16
- c. How many men said sports was their favorite activity? 10
- d. What percent of people surveyed prefer dance?  $\frac{18}{50} = .36$  36%
- e. What percent of people were women?  $\frac{30}{50} = .6$  60%
- f. What percent of men prefer sports?  $\frac{10}{20} = 50\%$
- g. What percent of people preferring sports are women?  $\frac{6}{16} = .375$  37.5%

2 – Use the two-way table to answer the questions below:

A survey was performed comparing the favorite music of students in grade 9 and 10.

Extra info: 25% of those surveyed were in grade 9. Half of 10<sup>th</sup> graders prefer country. No 9<sup>th</sup> graders prefer R&B.

	R&B	Rock	Country	Total
Grade 9	0	14	6	20
Grade 10	20	10	30	60
Total	20	24	36	80

- a. Complete the table.
- b. What percent of people surveyed prefer R&B?  $\frac{20}{80}$  25%
- c. What percent of 10<sup>th</sup> graders prefer R&B?  $\frac{20}{60} = 33\%$
- d. What percent people preferring Rock are in grade 9?  $\frac{14}{24}$  58.3%



A random sample of 200 teenagers participated in a taste test. Each teenager sampled four choices of fruit drink (labeled "A", "B", "C", and "D"), and then were asked to pick a favorite. The table shows the results of this taste test.

	A	B	C	D	Total
Boys	45	25	30	20	120
Girls	25	10	30	15	80
Total	70	35	60	35	200

Based on the information given, which of the given statements are true?

Select all that apply.

- A. 40% of the participants were girls.  $\frac{80}{200} = 40\%$
- B. 70% of the participants preferred "A".  $\frac{70}{200} = 35\%$
- C.  $\frac{20}{120}$  of the boys preferred "D".
- D.  $\frac{10}{35}$  of the participants who preferred "B" were girls.
- E. The proportion of boys who preferred "C" is equal to the proportion of girls who preferred "C".

$$\frac{30}{120} \quad \frac{30}{80}$$

Members of two cross-country teams ran an obstacle course. The table shows the times, in minutes and seconds, for the members of team R to complete the course.

Team R Obstacle Course Times

5:32	6:48	4:25	8:05	7:23
5:37	5:12	6:26	5:31	4:43
6:08	7:16	5:52	5:21	6:53
4:49	5:02	6:33	5:54	6:20

The obstacle course times, in minutes and seconds, for team S are summarized in the box plot shown.

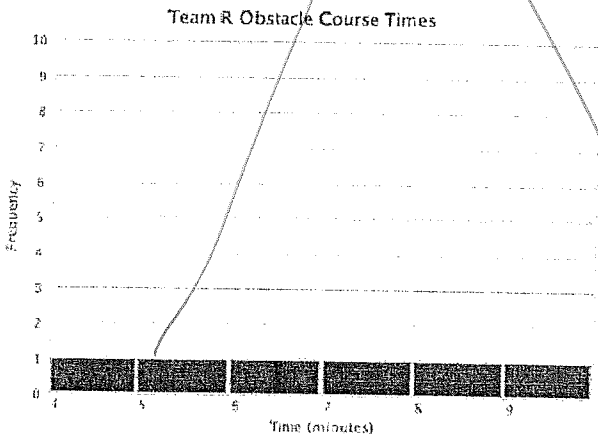
Team S Obstacle Course Times



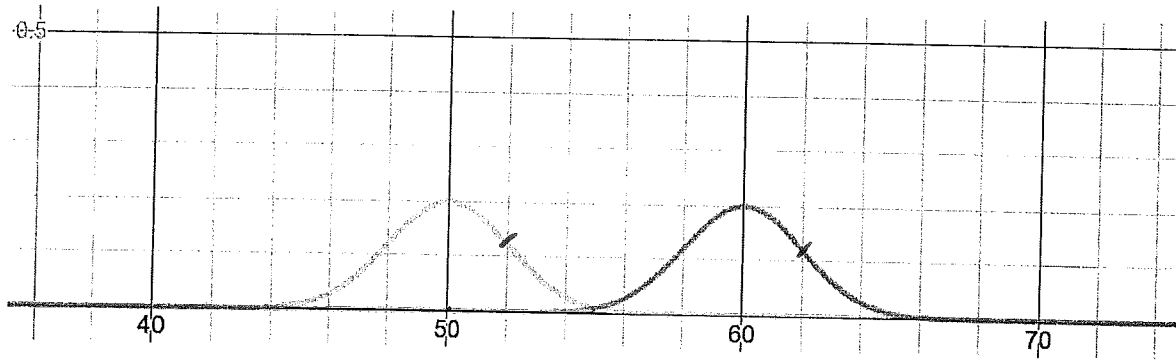
Part A

Create a histogram showing the data for Team R.

Adjust the size of the slider by dragging the top of the slider to the appropriate height.



5 – The heights of elementary students is found to be normally distributed for each grade. The graphs of the 2<sup>nd</sup> grader students and 5<sup>th</sup> grade students is shown below. Unit: inches.



a. Which graph represents each grade?

b. What is the mean height for each grade?

2: 50 in    5: 60 in

c. True or false: The median height for 5<sup>th</sup> graders is equal to the mean height of 5<sup>th</sup> graders.

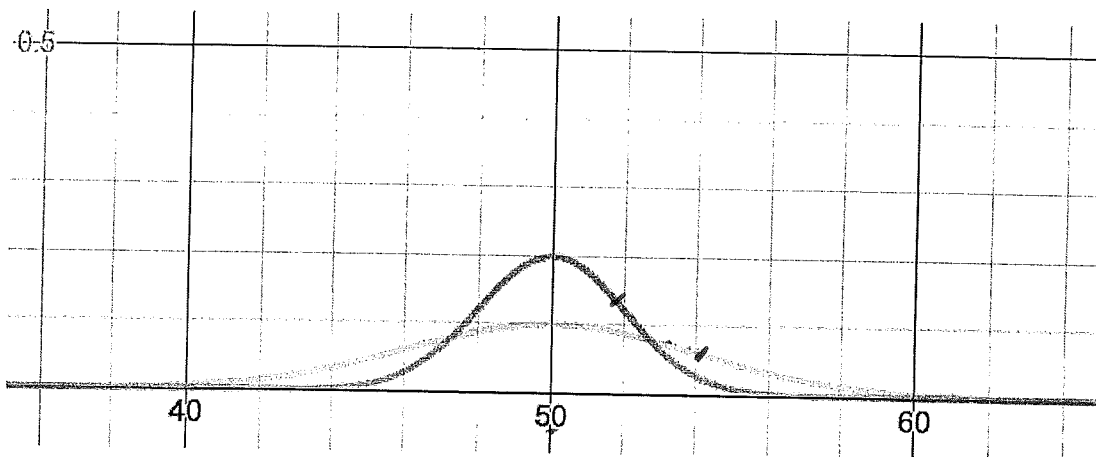
d. The claim is made that the distribution is more variable for 3<sup>rd</sup> graders than 5<sup>th</sup> graders. Based on the graph do you agree with this claim?

NO

\* e. True or false: half of the <sup>2nd</sup> graders are shorter than 50 inches. True

\* f. True or false: all 5<sup>th</sup> graders are taller than all <sup>2nd</sup> graders. False

6 – Use the following graph to state if the claims below are true.



a. Both graphs are symmetric True

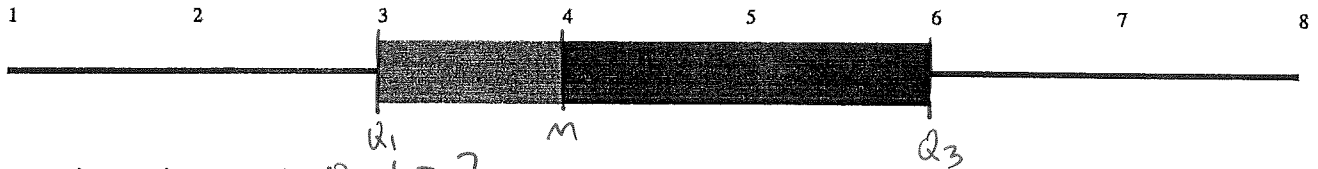
b. The means of the graphs are the same Yes: 50

c. The variation of the graphs are the same NO

d. A value is selected from the data used to create the tall graph. This data point is equally likely to be greater than 50 as it is to be less than 50.

True

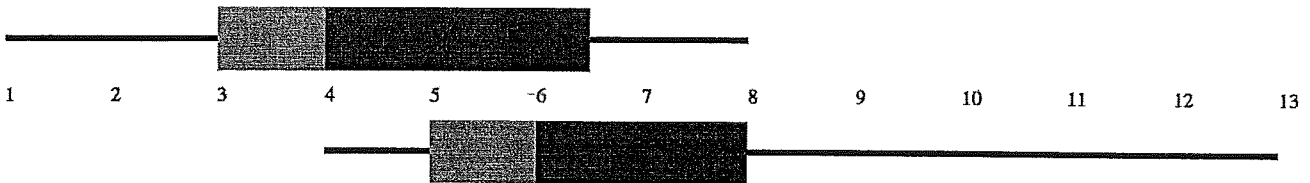
7 – The box plot below shows the number of sick days taken by employees during the last year. Use the box plot to answer the following questions:



- a. What is the range?  $8 - 1 = 7$
- b. What is the median? 4
- c. What is the interquartile range?  $6 - 3 = 3$
- d. In order to be in the lowest 25%, a value must be below what number? 3
- e. In order to be in the lowest 75%, a value must be below what number? 6
- f. What percent is between 3 and 8? 75%
- g. If the company employs a total of 60 workers, then how many people missed fewer than 3 days?  
 $(.25)60 = 15 \text{ workers}$

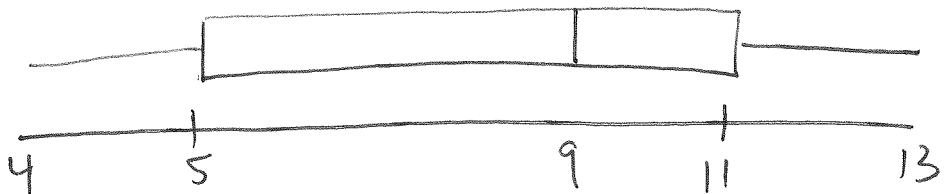
8 – Use the double box plot below to answer the questions:

top plot = points scored during John's sophomore year on the basketball team.



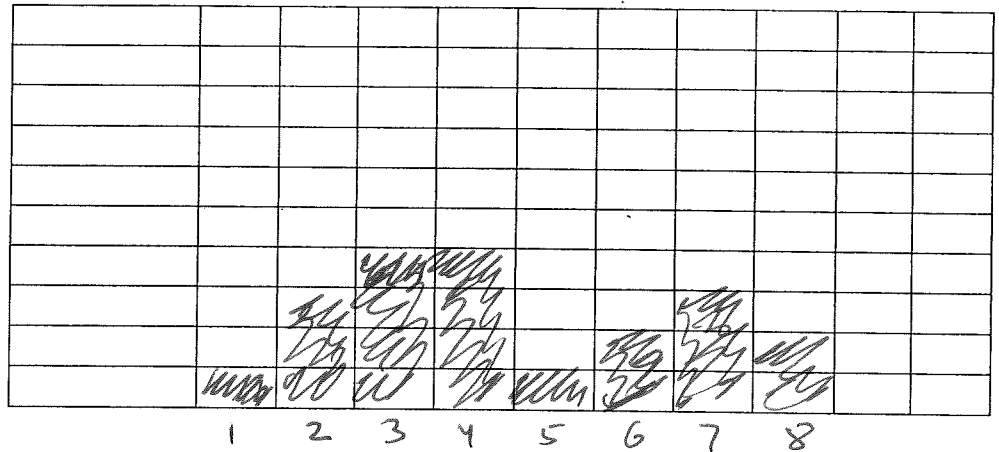
bottom plot = points scored during John's junior year on the basketball team.

- a. Which year did John score more points? How do you know? Jun. all 5-num sum. values are greater
- b. In which year did John have his highest scoring game? Explain? Jun. 13
- c. In which year was John's performance more consistent (less variable)? Range: Soph  
IQR: Jun.
- d. Draw a potential box plot for John's senior year such the median improved, the range is the same and the interquartile range is twice as wide as junior year.

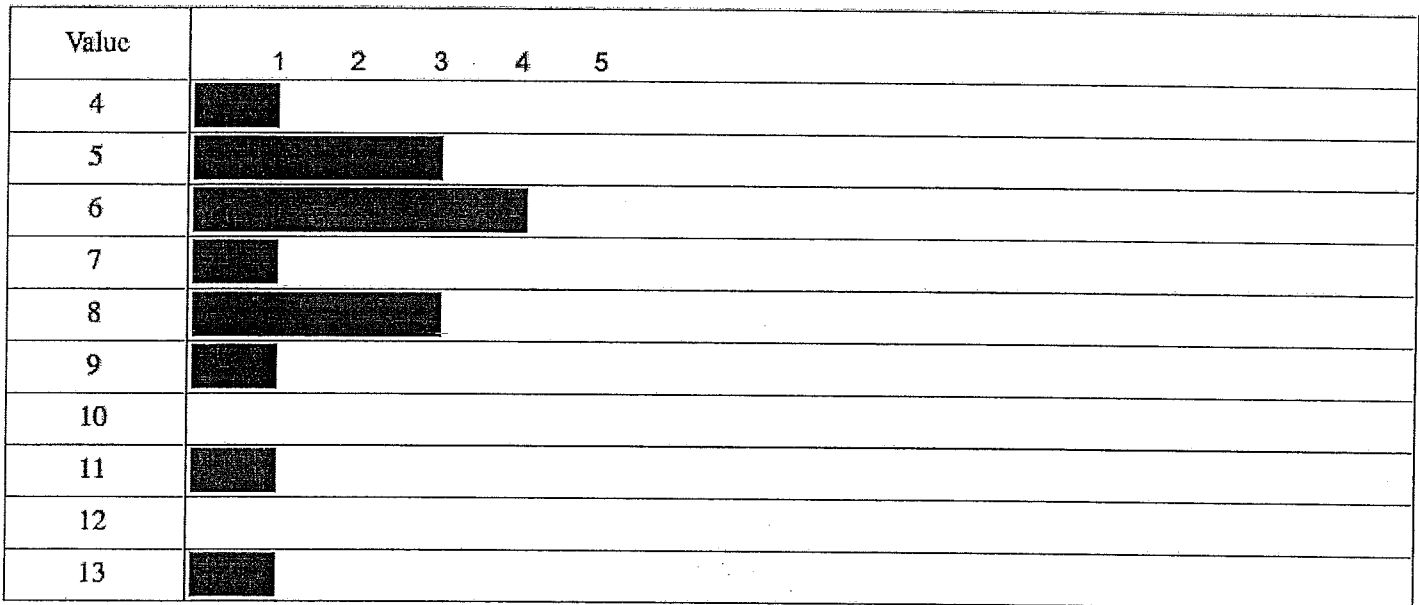


9 – create a histogram from the table below:

Value	Frequency
1	1
2	3
3	4
4	4
5	1
6	2
7	3
8	2



10 – Use the histogram below to answer the questions below:



- Show the data used to create the plot.  $4, 5, 5, 5, 6, 6, 6, 6, 7, 8, 8, 8, 9, 11, 13$   
 $n = 15$
- Find the median.  $6$
- Find the mean.  $7.1\bar{3}$
- Find the range.  $9$
- Find the interquartile range.  $3$
- What percent of the data values are less than 7?  $\frac{8}{15} = .53$  53%
- How many values are greater than 7?  $\frac{6}{15} = 40\%$

11.

1. **Protecting wood** How can we help wood surfaces resist weathering, especially when restoring historic wooden buildings? In a study of this question, researchers prepared wooden panels and then exposed them to the weather. Here are some of the variables recorded: type of wood (yellow poplar, pine, cedar); type of water repellent (solvent-based, water-based); paint thickness (millimeters); paint color (white, gray, light blue); weathering time (months). Identify each variable as categorical or quantitative.

C  
C  
Q  
C

Q

12. Use the stem and leaf plot below to answer the questions given than  $4|3 = 43\%$

1	2 6	Min = 12
2	8 9 9	Q1 = 29
3	0 1 6 6 8	Med = 36
4	5 6 8	Q3 = 47
5	0 0 2	Max = 52

Range = 40  
IQR = 18  
Mean = 36  
St. Dev = 12.04

$n = 16$

\* How many scores are above 40%?

$$\frac{6}{16} = 37.5\%$$

What percent of scores are less than 30?

$$\frac{5}{16} = 31.25\%$$

13 The mean age of people living in a neighborhood is 50 with standard deviation 6.

$$\bar{x} = 50$$

$$s_x = 6$$

- a) What percent is over age 40?  $95.22\%$
- b) What percent is between age 46 and 54?  $49.5\%$
- c) What age places you in the top 10% on the block?  $57.7$
- d) Find the IQR  $58$   

$$\left. \begin{array}{l} Q_1 = 45.95 \\ Q_3 = 50.05 \end{array} \right\} 4.1 = \text{IQR}$$

14 Bill takes AP Stats. His grade is an 88% the class has an average grade of 90% with st. dev. = 4%.

John takes CCP Stats. His grade is an 84% the class has an average grade of 86% with st. dev. = 10%.

\*

$$z = \frac{x - \bar{x}}{s_x}$$

$$\text{Bill} = \frac{88 - 90}{4} = -0.5$$

$$\text{John} = \frac{84 - 86}{10} = -0.2$$

John has a better z-score so he is doing better

15 Betty analyzed the study time and quiz score of her stats class on the last quiz. Identify the explanatory and response variable.

exp (x) = study time

Resp (y) = quiz score

16 The correlation between the response variable mood (1-10) based on the explanatory variable internet speed (MBps) is  $r = .6$ .

a) Describe the meaning of  $r = .6$

→ There is a mod. str. assoc. between mood & speed. As Int. speed goes up, mood goes up.

b) If the response and explanatory variables are reversed, how is  $r$  affected?

$$r = .6$$

c) The internet speed in MBps can be converted to BPS by multiplying by 1,000,000. What is the correlation after converting internet speed to BPS?

$$r = .6$$