

WHAT'S YOUR OPINION?

You have been asked by a committee to help analyze some statistics to choose this year's top basketball player. The player will receive the BEST PLAYER award. Below is the information that you have been given to form your opinion. You will be writing a letter to the committee based on your analysis. Start by filling in the tables to begin the process.

GAME STATS for Points Scored:

GAME	Rashad	Tony	Sam
#1	12	18	24
#2	13	21	14
#3	12	15	14
#4	14	13	22
#5	11	16	25
#6	20	18	16
#7	16	18	11

	Rashad	Tony	Sam
High Score			
Median			
Mean			
Mode			
Range			

Different ways to possibly Rank the Basketball Players:

	Ranked by Highest Score	Ranked by Median Score	Ranked By Mean Score	Ranked By Mode	Ranked By Range
Rashad					
Tony					
Sam					

CONCLUSION:

You are to write a formal letter to the committee to convince them of one of the following arguments:

- *that one of the players is the best player
- *that two of the players are the best
- *that all the players are equally good
- *that it doesn't make sense to give out this kind of award

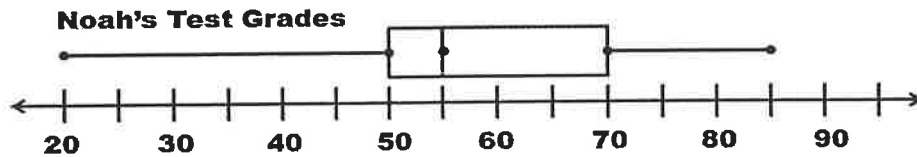
Your letter should include an analysis of the data that helped you to come to this conclusion. Remember to state your position and offer at least three reasons that support your decision. Your letter should include an introduction, three supporting paragraphs, and a wrap-up/conclusion to convince the committee of your choice. The rubric below will be used to grade the final product.

RUBRIC:

CATEGORY	PTS	Received
Appropriate Format (letter):	5	
Position clearly stated in introduction	15	
3 reasons of support	18	
Accurately explained mean, median, mode and range within context	30	
Five well developed paragraphs	20	
Conclusion: appropriate closure and restated position	12	

Comparing Box Plots Notes

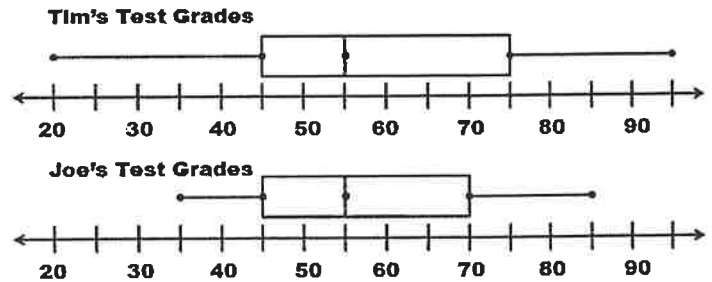
Name _____



Vocabulary	Definition	From Above
Five-Number Summary	the five numbers used to create the box plot: lower extreme, Q1, median, Q3, and upper extreme	
Range	the difference between the maximum and minimum values in a distribution	
Interquartile Range	the difference between Q3 minus Q1 marks in a box plot - where the middle 50% of the data can be found	
Symmetrical	characterized by or exhibiting symmetry; well-proportioned, as a body or whole; regular in form or arrangement of corresponding parts	
Cluster	a group of things or persons close together	

Example:

The two box plots at the right compare the test grades for Tim and Joe in math class for the entire school year.



1. Find the median, range, and interquartile range for Tim and Joe.

2. Use the medians to compare the students' grades.

3. Use the interquartile range to compare the students' grades.

4. Use the range to compare the students' grades.

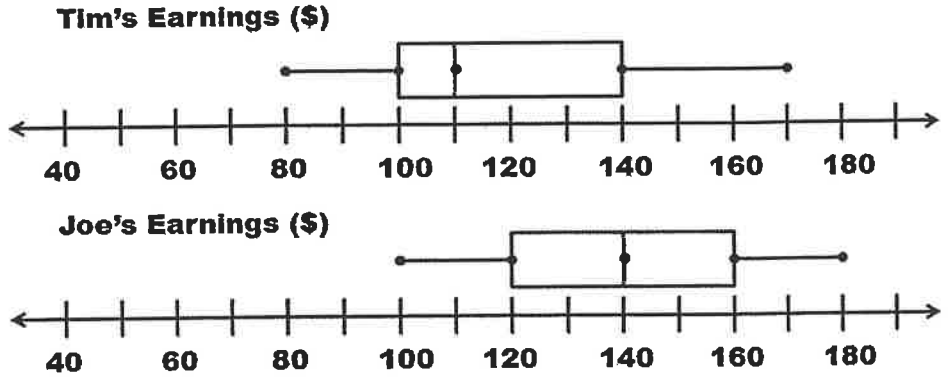
5. Use of evidence of cluster and/or symmetry to compare the students' grades.



Pause the video and try these on your own!
Then press play and check your answers with a color pen

Example:

The two box plots at the right compare the amount of money that Tim and Joe earned in one day while working at a restaurant.



1. Find the median, range, and interquartile range for Tim and Joe.

2. Use the medians to compare the boys' earnings.

3. Use the interquartile range to compare boys' earnings.

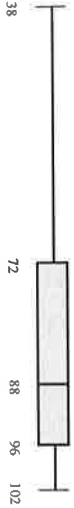
4. Use the range to compare the boys' earnings.

5. Use of evidence of cluster and/or symmetry to compare the boys' earnings.

Box & Whisker Worksheet

For questions 1 – 6, refer to the box & whisker graph below which shows the test results of a math class.

Test Scores (as %) for 6th Period



1. What was the high score on the test?

2. What percent of the class scored above a 72?

3. What was the median score on the test?

4. What percent of the class scored between 88 & 96?

5. Do you think that this test was too hard for the students? Explain.

6. Would you expect the mean to be above or below the median? Explain.

For questions 7 – 11 refer to the box & whisker graph below that shows how much time was spent per night on homework for sophomore class at a certain high school during September.

Average Minutes Per Night Spent On Homework



7. What percent of the sophomores spend more than 60 minutes on homework per night?

8. What is the range of times that the middle 50% of the sophomores spend on homework per night?

9. How many sophomores do not do homework?

10. What percent of the sophomores spend less than 20 minutes per night on homework?

11. Would you expect the mean number of minutes per night to be higher or lower than the median? Explain.

For questions 12 – 23, refer to the box & whisker graphs below that compare homework time per night with TV time per night for the same group of sophomores.

TV & Homework Minutes per Night



12. What percent of the sophomores watch TV for at least 15 minutes per night?

13. What is the 3rd quartile for the TV time data?

14. Is it more common for a sophomore at this high school to spend more than 1 hour on homework or more than 1 hour watching TV? Explain.

For questions 15 – 23, identify if each statement is true, false, or cannot be determined.

15. Some sophomores didn't watch TV that month.

16. The TV box & whisker graph contains more data than the homework graph.

17. 25% of the sophomores spend between 48 & 60 minutes per night on homework.

18. 15% of the sophomores didn't watch TV that month.
19. In general, these sophomores spend more time watching TV than doing homework.
20. The TV data is more varied than the homework data.
21. The ratio of sophomores who spend more than 110 minutes per night watching TV to those who spend less is about 2:1.
22. 225 sophomores watch TV.
23. Twice as many sophomores watch TV for more than 1 hour than do homework for more than 1 hour.
24. Suppose that one family kept track of how many DVDs they rented each month for a two year period. The numbers for each month are shown in the table below. Make a box & whisker graph from this data.

J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
3	5	2	8	1	5	0	3	6	4	9	15	3	6	4	1	10	3	8	7	2	9	0	11

Month	Pullman Averages	Seattle Averages
January	34.5	44.7
February	40.5	50.1
March	47.0	53.4
April	55.9	59.4
May	64.4	66.7
June	71.2	71.2
July	81.6	76.9
August	81.9	76.3
September	72.8	71.0
October	59.8	61.3
November	43.7	52.0
December	35.9	47.1

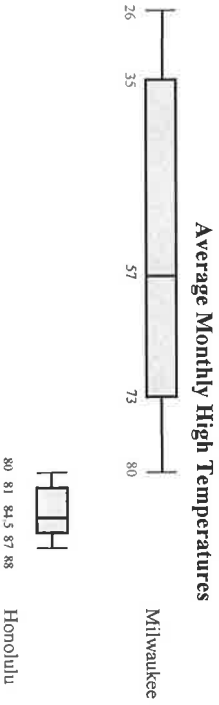
26. In the table below, the average monthly temperatures for Pullman and Seattle are shown. Draw a box & whisker graph (using the same scale) for each city from the data. Then write a short paragraph summarizing what your graphs tell you.

For questions 27 – 35, refer to the following data that shows the total number of points scored in each of the rose bowls from 1970 until 2006.

Year	Total Points	Year	Total Points	Year	Total Points	Year	Total Points
1970	13	1980	33	1990	27	2000	26
1971	44	1981	29	1991	60	2001	58
1972	25	1982	28	1992	48	2002	51
1973	59	1983	38	1993	69	2003	48
1974	63	1984	54	1994	37	2004	42
1975	35	1985	37	1995	58	2005	75
1976	33	1986	73	1996	73	2006	79
1977	20	1987	37	1997	37	2007	50
1978	47	1988	37	1998	37		
1979	27	1989	36	1999	69		

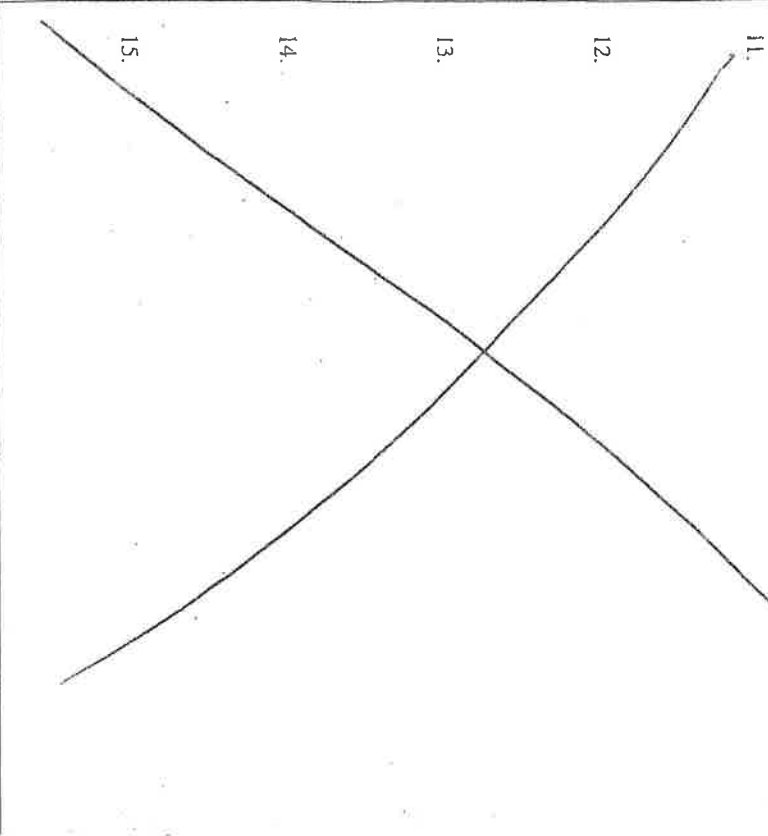
27. Make a box & whisker graph for the total points scored in each decade. Make sure your 4 graphs are drawn with the same scale so you can compare them.

For question 25, refer to the box & whisker graphs below that show the average monthly high temperatures for Milwaukee, Wisconsin & Honolulu, Hawaii.



25. Write a short paragraph comparing the temperatures in both cities.

For #11-15, draw a box-and-whisker plot of #1-5.
(Use the answers you found in #6-10.)



11. Which of the following is the stem-and-leaf plot for the following data?
59, 55, 23, 25, 58, 41, 50, 37, 29, 59, 29
- a. $\begin{array}{r|l} 5 & 05899 \\ 4 & 1 \\ 3 & 7 \\ 2 & 3599 \end{array}$
- b. $\begin{array}{r|l} 2 & 9539 \\ 3 & 7 \\ 4 & 1 \\ 5 & 98509 \end{array}$
- c. $\begin{array}{r|l} 2 & 3599 \\ 3 & 7 \\ 4 & 1 \\ 5 & 05899 \end{array}$
- d. $\begin{array}{r|l} 5 & 98509 \\ 4 & 4 \\ 3 & 1 \\ 2 & 7 \\ 1 & 9539 \end{array}$

12. Which of the following is the upper quartile of the data in #1?
- a. 37
b. 29
c. 50
d. 41
13. Which of the following is the upper quartile of the data in #1?
- a. 50
b. 58
c. 59
d. 55

Review

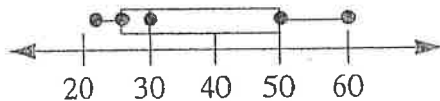
4. What is the lower quartile of the data in #1?
- a. 29
b. 23
c. 25
d. 37
5. 20, 31, 41, 21, 32, 45, 20, 40, 48, 33, 48
Which number is the lower extreme?
- a. 48
b. 20
c. 45
d. 31
6. Which number is the upper extreme of the data in #5?
- a. 20
b. 45
c. 31
d. 48
7. What is the median of the data in #5?
- a. 33
b. 32
c. 40
d. 31
8. What is the lower quartile of the data in #5?
- a. 20
b. 31
c. 32
d. 21
9. What is the upper quartile of the data in #5?
- a. 41
b. 45
c. 40
d. 48

10. Which of the following is the box-and-whisker plot for the data in #5?
- a.
- b.
- c.
- d.
11. There are 31 boys in the YMCA camp. They wanted to make a box-and-whisker plot of the number of pushups each student could do. What is the first thing they should do?
- a. Put data in order from smallest to largest.
b. Calculate the median of the data.
c. Find the upper and lower extremes.
d. Find the upper and lower quartiles.
12. What is the median point for this box-and-whisker plot?
-
- a. 20
b. 55
c. 45
d. 35
13. What are the quartiles in this list of data?
15, 20, 10, 12, 5, 11, 15
- a. 5 and 20
b. 11 and 15
c. 10 and 15
d. 12 and 15

14. If the box-and-whisker plot in #12 were weights of preschool children, which statement is true?
- The weights ranged between 10 and 55 pounds.
 - Half of the weights were between 10 and 20 pounds.
 - Half of the weights were between 20 and 30 pounds.
 - The weights ranged from 20 to 35 pounds.

15. Using the box-and-whisker plot in #12, how does a preschooler compare to the median weight if he weighs 30 pounds?
- He is lighter than the median weight.
 - He is heavier than the median weight.
 - He is the same weight as the median weight.
 - He is twice as heavy as the median weight.

16. Which set of data does this box-and-whisker plot represent?



- 35, 42, 51, 36, 42, 60, 58
- 21, 40, 31, 61, 55, 48, 37
- 40, 50, 21, 58, 35, 48, 20
- 22, 60, 41, 50, 23, 30, 21

17. Which stem-and-leaf plot represents this set of test scores?
61, 78, 87, 73, 68, 91, 88, 95, 97

a.	6		18		c.	6		81
	7		38			7		83
	8		78			8		87
	9		157			9		751

b.	9		157		d.	9		751
	8		78			8		87
	7		38			7		83
	6		18			6		81

18. What could you assume from the data in #17 if 70 is passing?
- Most students failed this test.
 - Most students made C's on this test.
 - Most students passed this test.
 - Most students made A's on this test.

19. What are the extremes of this data?
89, 56, 25, 8, 100, 53, 91
- 89 and 91
 - 91 and 100
 - 8 and 100
 - 53 and 56

20. What are the quartiles of the data in #19?
- 56 and 89
 - 25 and 91
 - 53 and 89
 - 8 and 100

Standard Deviation and Absolute Deviation – Independent Practice

Complete all the problems.

1. In the data set below, what is the mean absolute deviation?

10, 16, 18, 15, 15, 10, 23

2. In the data set below, what is the mean absolute deviation?

41, 56, 38, 45, 55, 51, 52

3. In the data set below, what is the mean absolute deviation?

10, 12, 18, 25, 25, 11, 22

4. In the data set below, what is the mean absolute deviation?

22, 33, 44, 55, 66, 88, 55, 55, 11, 22

5. In the data set below, what is the mean absolute deviation?

10, 60, 80, 50, 50, 10, 20

6. The weight of patients is recorded in the hospital. The weights are listed below. What is the standard deviation of the weight?

56 kgs, 64 kgs, 78 kgs, 66 Kgs, 70kgs, 65 kgs, 89 kgs

7. The grades of 10 students in math class are listed below. What is the standard deviation of the scores?

45, 48, 35, 50, 20, 25, 46, 24, 38, 32

8. The weather was tracked for one week. The temperature was as follows. What is the standard deviation?

24, 26, 21, 20, 25, 26, 27

9. Calculate the standard deviation of the following data set:

70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80

10. In the data set below, what is the mean absolute deviation?

76, 67, 82, 25, 54, 15, 24



What Dance Should You Do When Summer Is Over?

Solve each problem and find your answers at the bottom of the page. (Round each mean to the nearest 0.1 unit.) Shade out the letter above each correct answer. When you finish, the answer to the title question will remain. Now, get mean!

- 1 Nero, Hero, and Zero each bowled three games.
 A. What is Nero's mean score?
 B. What is Hero's mean score?
 C. What is Zero's mean score?

Name	Game 1	Game 2	Game 3
Nero	157	125	146
Hero	133	160	167
Zero	144	151	122

- 2 The scores on a mathematics test for a group of students were 85, 92, 67, 81, 90, 76, 94, 85, 56, and 79.
 A. What is the range of the scores?
 B. What is the mean score?

Planet	Diameter (km)	Escape Velocity (km/sec)
Mercury	5,000	4.2
Venus	12,200	10.3
Earth	12,757	11.3
Mars	6,750	5.0
Jupiter	142,900	60.5
Saturn	120,900	35.2
Uranus	46,500	21.7
Neptune	45,000	24.0
Pluto	6,500	4.9

- 3 The diameter of each of the 9 planets and the escape velocity from each planet are given in the table. (The escape velocity is the speed necessary to escape the gravitational pull of the planet.)
 A. What is the range of the diameters?
 B. What is the mean diameter?
 C. What is the range of the escape velocities?
 D. What is the mean escape velocity?

Position	Height (cm)	Weight (kg)
Center	206	91.8
Forward	193	85.3
Forward	198	84.9
Guard	172	78.0
Guard	190	81.5

- 4 What is the mean number of letters in the words of this sentence?

P	I	R	A	T	E	S	R	A	N	T	H	U	G	B	O	A	T	S
34 cm	153.3	84.3 kg	80.5	83.5 kg	13.8 kg	4.0	142.7	193.1 cm	44,280.1 km	44,278.6 km	56.3 km/sec	139.0	18.5 km/sec	38	4.2	19.7 km/sec	191.8 cm	137,900 km

- 5 The height and weight of the starting players on the Big Buckets basketball team are given in the table.
 A. What is the range of the heights?
 B. What is the mean height?
 C. What is the range of the weights?
 D. What is the mean weight?

What Happened After Orgo Bought Snow Tires?

Cross out each box containing the correct answer to an exercise. When you finish, write the letters from the boxes that are not crossed out in the boxes at the bottom of the page.

- 1 Find the median for each set of numbers.
 A. {26, 34, 45, 61, 69}
 B. {1.8, 1.9, 2.3, 2.5, 2.9, 3.4, 4.2, 4.8}
 C. {3, 7, 7, 7, 12, 15, 16, 18, 18, 18, 23, 31}
 D. {5.4, 2.5, 3.6, 9.7, 6.1, 5.8, 1.3, 8.8, 2.5, 7.4}

Price of Record Album "X" at various stores			
\$4.69	\$4.25	\$5.98	
5.50	5.98	6.50	
4.49	4.75	5.25	
4.95	4.39	5.29	

- 2 Five people earn the salaries given in the table.
 A. What is the mean salary?
 B. What is the median salary?

President	\$420,000
Lawyer	35,000
Accountant	20,000
Secretary	14,000
Custodian	11,000

- 3 Find the mode of each set of numbers.

A. Test Scores
62 77 89
67 80 89
69 83 92
69 85 93
75 85 95
77 89 95
77 89 98

B. Student Heights (m)
1.47 1.55 1.65 1.72
1.48 1.58 1.66 1.75
1.46 1.58 1.66 1.75
1.53 1.60 1.66 1.78
1.53 1.64 1.69 1.81
1.54 1.65 1.70 1.88

C. Outcomes for 30 Tosses of Two Dice
9 10 5 7 7
2 3 5 6 4
7 7 8 5 4 6
6 6 7 9 11 9
1.54 1.65 1.70 1.88
4 8 12 9 7 3

- 4 The rainfall for a city is given in the table. Find the following:
 A. The mean rainfall per month
 B. The median rainfall per month
 C. The mode of the rainfall measurements

Month	Rainfall (cm)	Month	Rainfall (cm)
January	8.5	July	2.4
February	9.5	August	2.4
March	12.1	September	6.2
April	14.7	October	12.3
May	9.3	November	11.9
June	5.0	December	10.0

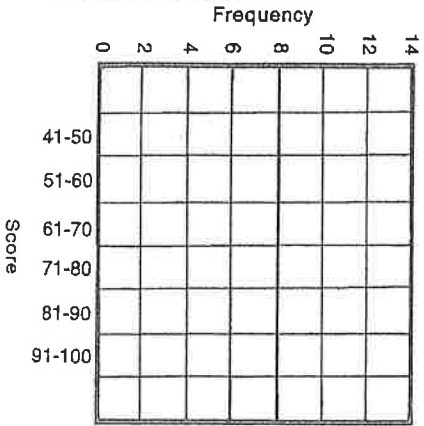
HE	PU	TH	AT	SL	EY	SO	ME	ID
1.66 m	5.6	1.65 m	\$5.10	15.5	69	2.4 cm	9.1 cm	\$100,000
BA	LL	FE	LT	IR	SN	SN	OW	ED
\$20,000	45	7	\$5.20	89	8.7 cm	2.7	9.4 cm	\$90,000

What Happens When Joggers Get Mad?

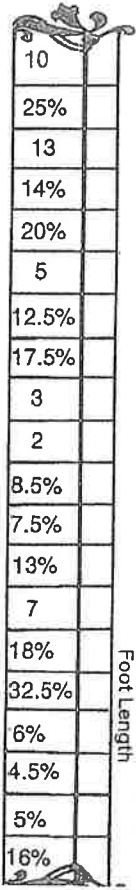
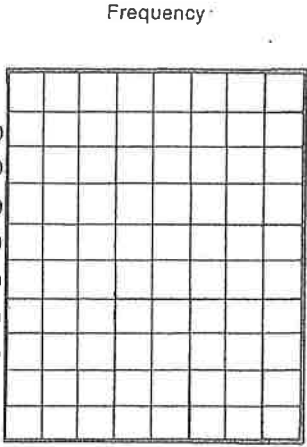
Complete each table. Write the letter of each table value in the box above the corresponding value at the bottom of the page. Make a histogram for each set of data.

Test Scores	
75	51
86	84
92	73
79	63
84	98
49	94
97	68
72	82
77	71
73	73
61	75
85	63
43	54
67	73
67	89
83	94
55	88
82	76
71	78
88	94

Score	Tally	Frequency	Percent
41-50		(P)	(I)
51-60		(A)	(M)
61-70		(I)	(E)
71-80		(E)	(A)
81-90		(T)	(H)
91-100		(A)	(V)



Student Foot Lengths (mm)	Frequency	Percent
181-190	12	(L)
191-200	32	(T)
201-210	28	(Y)
211-220	36	(C)
221-230	40	(H)
231-240	26	(S)
241-250	17	(H)
251-260	9	(F)

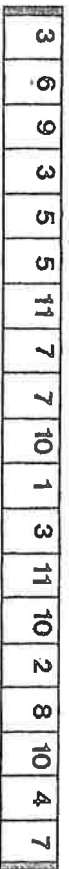
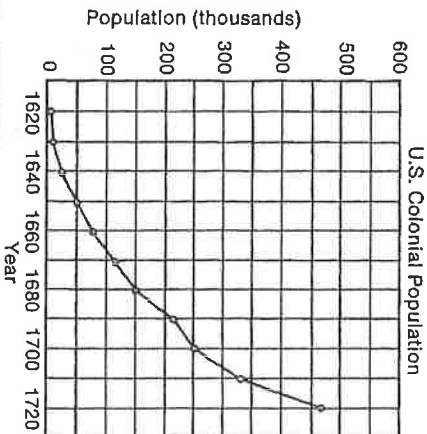
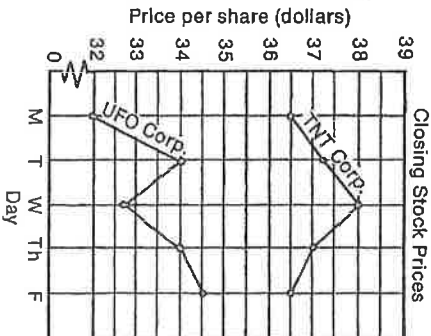


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What is a HIBVE?

CIRCLE the letter of the best answer for each exercise. Write the letter in each box that contains the number of the exercise.

- What was the closing price for TNT stock on Monday?
(F) \$37.00 (N) \$36.50
- What was the closing price for UFO stock on Wednesday?
(G) \$32.75 (S) \$32.25
- On what day was the closing price for TNT stock \$37.25 per share?
(A) Tuesday (T) Thursday
- What was the range of the closing prices for UFO stock during the week?
(R) \$2.00 (N) \$2.50
- What was the mean of the closing prices for UFO stock during the week?
(T) \$33.25 (L) \$33.45
- What was the median of the closing prices for TNT stock during the week?
(D) \$37.25 (S) \$37.00
- Give an estimate of the colonial population in 1660.
(E) 75,000 (O) 50,000
- In what year was the colonial population about 210,000?
(P) 1680 (H) 1690
- Give an estimate of the increase in population from 1620 to 1720.
(T) 480,000 (M) 460,000
- Based on the graph, what is a reasonable estimate for the colonial population in 1730?
(O) 500,000 (I) 600,000
- The population in 1650 was about what percent of the population in 1700?
(B) 20% (F) 25%



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Data Analysis Take Home Test

Name: _____

Class Period: _____

1. Ariel has a total of 320 points on all four of her exams. If these points are shared equally among the four exams, the result is 80 points per project—which is Ariel's mean score.
 - a. What would Ariel's mean score be if she had a total of 372 points for the four exams?
 - b. Give four possible exam scores that would result in this mean score.
 - c. What is the range of the scores for your answer b)?
2. Find the Mean Absolute Deviation of the data in the table below.

Digital Camera Prices (\$)			
140	125	190	156
212	178	196	224

 - a. What is the mean of the data in the table?
 - b. What is the mean absolute deviation of the data?
3. Five good friends have the following numbers of basketball cards:
Justin: 352 Alex: 347 Hannah: 265 Ashley: 261 Tyler: 325
 - a. What is the range of number cards of the five friends?
 - b. The five friends decided to share their cards equally. How many cards per friend will this be? Explain.

- c. The five friends forgot about another friend, Samantha, when cards were shared. Samantha has 261 cards, the same number of cards as Ashley. If Samantha's cards are included with the others' cards and shared equally among the six friends, will the first five friends receive less, the same as, or more than they did before Samantha's cards were included?
4. The following data are the number of hours of homework done by several students on a Monday night: [0.5, 0.5, 1, 1, 1, 1, 2, 3]. If you replaced data from a student who did 0.5 hours of homework with one who did 2 hours of homework:
 - a. What is the mean of the original data set [0.5, 0.5, 1, 1, 1, 1, 2, 3]?
 - b. What is the median of the original data set [0.5, 0.5, 1, 1, 1, 1, 2, 3]?
 - c. If the data is replaced (2 hours replaces one 0.5 hour as the question states), what will the new mean be? Explain why it changed.
 - d. If the data is replaced (2 hours replaces one 0.5 hour as the question states), what will the new median be? Explain why it changed.
 5. Using the data set below answer the following questions.
24, 15, 18, 20, 18, 22, 24, 26, 18, 26, 24
 - a. What is the upper quartile?
 - b. What is the maximum?
 - c. What is the lower quartile?
 - d. What is the minimum?
 - e. What is the interquartile range?
 - f. What percent of the data is between 15 and 24?

- g. What percent of the data is between 18 and 22?
- h. What is the range?

6. Trinity's scores on the first 4 tests were 97, 92, 76, and 89.

- a. What is the minimum score Trinity needs to make on the fifth test so that her mean test score is at least 85?
- b. Can Trinity score well enough so that her mean score is 90 or above?

c. If Trinity scores 100 on the fifth test, what is her median test score?

7. The table shows the amount of money raised by homerooms for two grade levels at a middle school. Find the mean absolute deviation for each set of data.

	Sixth Grade				Seventh Grade							
Money Raised (\$)	88	116	94	108	112	124	144	91	97	122	128	132

- a. What is the mean of the sixth grade data?
- b. What is the Mean Absolute Deviation of the sixth grade data?
- c. What is the mean of the seventh grade data?
- d. What is the Mean Absolute Deviation of the seventh grade data?

8. Using the information given in the table below about the points that two basketball players scored in each of the games they played this year.

Player	1	2	3	4	5	6	7	8	9	10
Player A	30	26	21	28	24	28	25	26	30	22
Player B	16	18	15	18	22	14	16	23	18	20

- a. What is the mean number of points scored for each player? Find the difference in the means.
- b. What is the Mean Absolute Deviation for each player?
Player A: _____
Player B: _____
- c. How many times greater is the difference in the means than the Mean Absolute Deviation for each player?

9. Each student in a class has taken five tests. The teacher allows the students to pick the mean, median, or mode of each set of scores to be their average. Which measure of center should this student pick in order to have the highest average? Explain in your own words why this would be the best choice.
100, 87, 81, 23, 19

10. Using the line plot below, what is the interquartile range?

