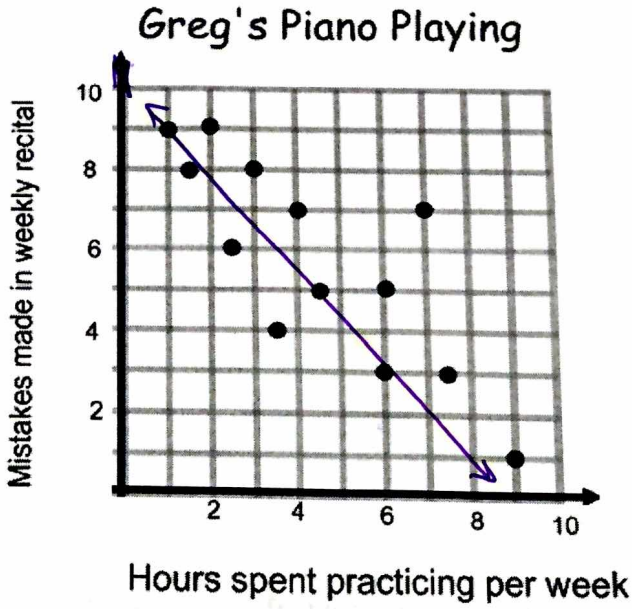
Unit 12: Data Analysis TEST

Name: Key

Date: _____ Algebra: _____

***Complete the following test on this sheet of paper in pencil. Show all of your work and include any explanations when necessary.***

1. The scatterplot to the right describes Greg's piano playing. He practices each week and gives a recital every weekend. Examine the graph and answer the questions below. (5)




a. Draw in a Line of Best Fit.

b. What type of correlation is shown on the graph?

Negative

c. Use your line of best fit to predict how many mistakes Greg would make if practiced for five hours a week.

about 5

d. Use your line of best fit to predict how many hours Greg would have practiced if he had made two mistakes in his recital.

about 8

e. What is the dependent variable? mistakes made

2. **James is conducting a survey about laptop computers. He wants to know if people like Macs or PCs better.**

(2) Which of the following is an example of a *unbiased survey method.* (choose only one)

a. Asking students who have iPhones.

b. Asking students "Do you like Macs or PCs better?"

c. Asking every 10th person who enters 405.

d. Asking students "Do you like fast, cool Macs or slow annoying PCs?"

3. Look at the data table to the right and answer the following questions:

(2)

a. Is this data univariate or bivariate? Bivariate

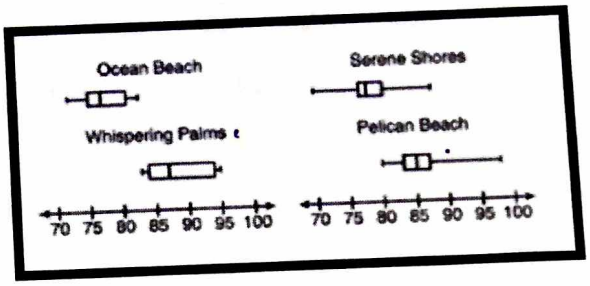
b. What kind of graph could you make from this data? Scatterplot

| Age of Student | Minutes of HW a night |
|---|---|
| 5 | 20 |
| 7 | 30 |
| 9 | 30 |
| 11 | 45 |
| 13 | 60 |
| 15 | 60 |
| 17 | 90 |

4.

(2)

Corinne is planning a beach vacation in July and is analyzing the daily high temperatures for her potential destination. She would like to choose a destination with a high median temperature and a small interquartile range. She constructed box plots shown in the diagram below.




Which destination has a median temperature above 80 degrees and the smallest interquartile range?

1) Ocean Beach
2) Whispering Palms
3) Serene Shores
4) Pelican Beach

5. The following data consists of weights, in pounds, of 20 adults:

(8)

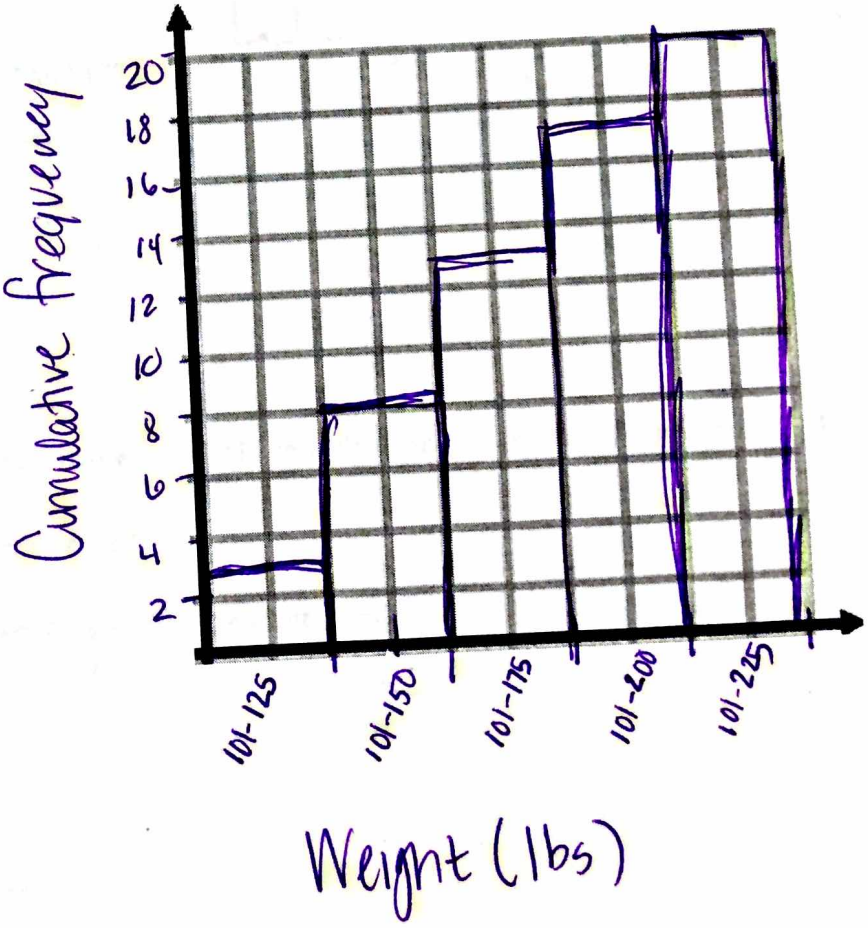
176, 154, 108, 215, 187, 162, 135, 120, 134, 190, 195, 142, 133, 209, 151, 150, 168, 172, 115, 221

a. Complete the frequency table to below.

| Interval | Tally | Frequency | Cumulative Frequency |
|---|---|---|---|
| 101-125 | III | 3 | 3 |
| 126-150 | IIII | 5 | 8 |
| 151-175 | IIII | 5 | 13 |
| 176-200 | IIII | 4 | 17 |
| 201-225 | III | 3 | 20 |

B. Construct a **cumulative frequency historgram**:

Weight histogram



6. The following data set are the scores earned on the English Regents by Mr. James' class last June.

64, 65, 68, 70, 71, 72, 77, 79, 80, 82, 84, 84, 86, 89, 90, 91, 94

(6)

Find the Measure of Central Tendency for this data set:

Mean: 79.18 Median: 80 Mode: 84 Range: 30

Which MCT value is the best representation of the data set? Explain why?

The mean because there is no outlier

7. Examine the graph to the right and answer the following:

(3)

a. How many students are in Kyra's class?

16

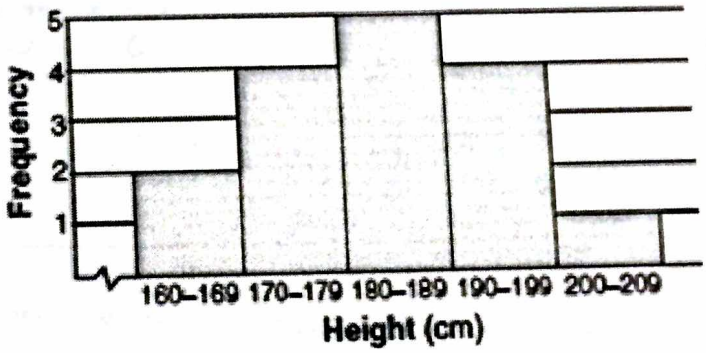
b. How many students are 190 cm or taller?

5

c. How many students are between 170 and 179 cm tall?

4

The accompanying histogram shows the heights o the students in Kyra's health class.




8. Which of the following is an example of a question that will result in univariate qualitative data? (choose only one)

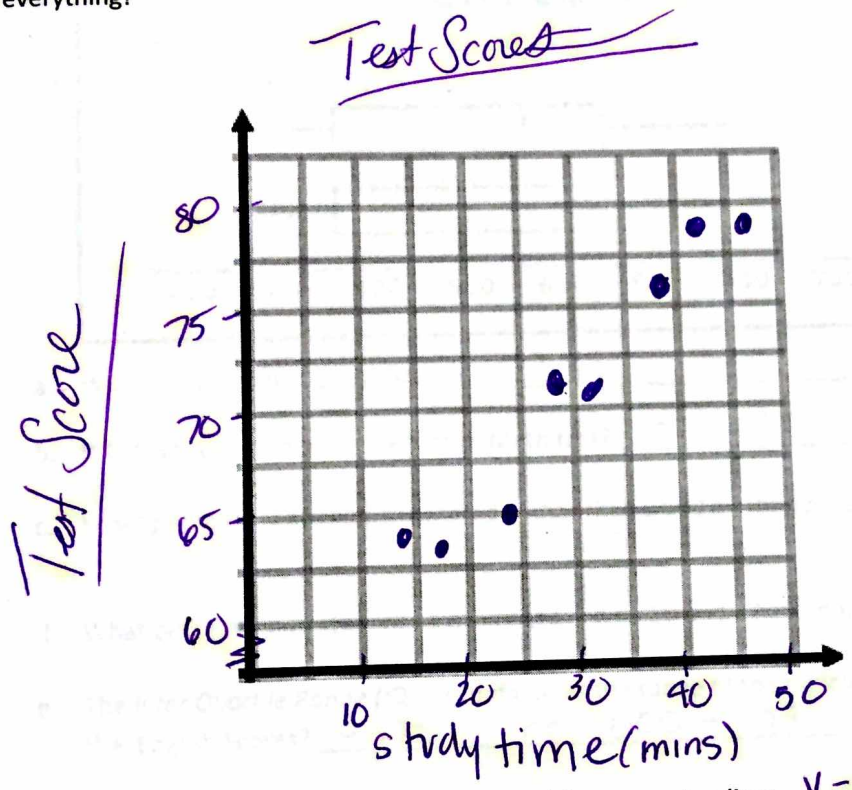
(2)

a. *What is your favorite animal?*
b. *How old are you and what is your allowance?*
c. *What is your GPA?*
d. *What borough do you live in and what is your favorite sport team?*

a. Make a scatter plot of the data displayed in the table. Be sure to choose an appropriate scale and label everything!

| Study Time (min) | 14 | 17 | 24 | 28 | 31 | 38 | 41 | 46 |
|---|---|---|---|---|---|---|---|---|
| Test Score | 64 | 63 | 65 | 72 | 71 | 76 | 78 | 78 |

(10)




b. Use your calculator to find the exact equation of the regression line: $y = 0.528x + 55.1$

c. What type of correlation does the data show? positive

d. If a student studies for 20 minutes, what is the predicted score on the test? ~66

e. If a student scored an 85 on the test, how long does the regression line say they studied for? ~57 mins

f. What is the r-value for the data? .963 Explain what that r-value means:
There is a strong correlation between how long a kid studies and the grade they get on the test.

10. The following data table shows the number of bacteria in a petri dish after a certain number of hours.

(2)

| Hours | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Bacteria | 10 | 12 | 17 | 21 | 28 |

Which of the following equations is an exponential model that represents the bacterial growth?

a. $y = 9.75^x$

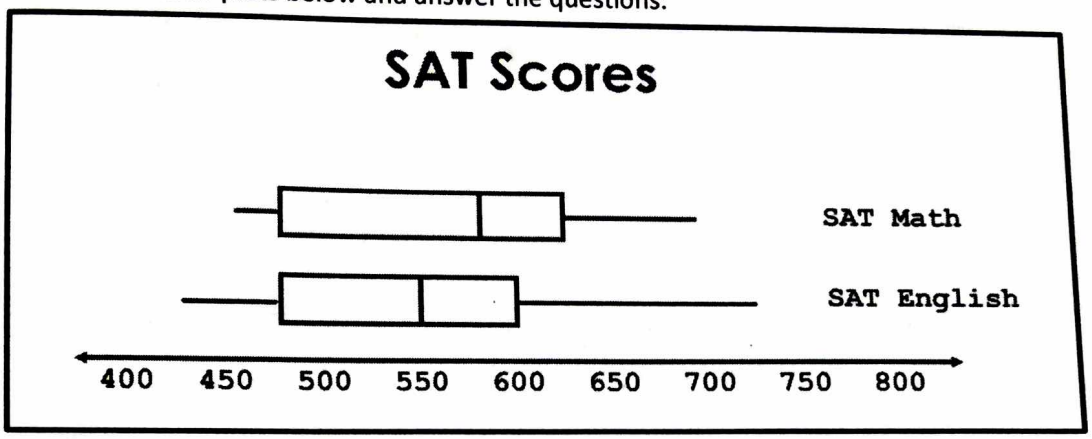
b. $y = 1.30 * 7.5^x$

c. $y = 7.5 * 1.30^x$

d. $y = 7.5 + 1.30^x$

11. Examine the box and whisker plots below and answer the questions:

5




a. Which test has the higher median? Math

b. What is the Minimum score for the Math test? ~450

c. What percentage of students scored higher than a 600 on the English test? ~25%

d. What percentage of students scored between a 450 and a 625 on the math test? : ~75%

e. The *Inter Quartile Range (IQR)* is defined as the range of the middle 50% of the data. What is the IQR of the English Scores? ~125 or 600 − 475

12. Mr. Williams gives a test for his science class. The MCT of the data set is:

4

Mean= 83, Median =79, Mode = no mode and Range = 23.

He decides to curve the test and give everyone 5 points of extra credit. What are the new MCT:

Mean= 88 Median= 84 Mode= no mode Range= 23

13. The following data set are the scores on the Algebra Regents for 12 students

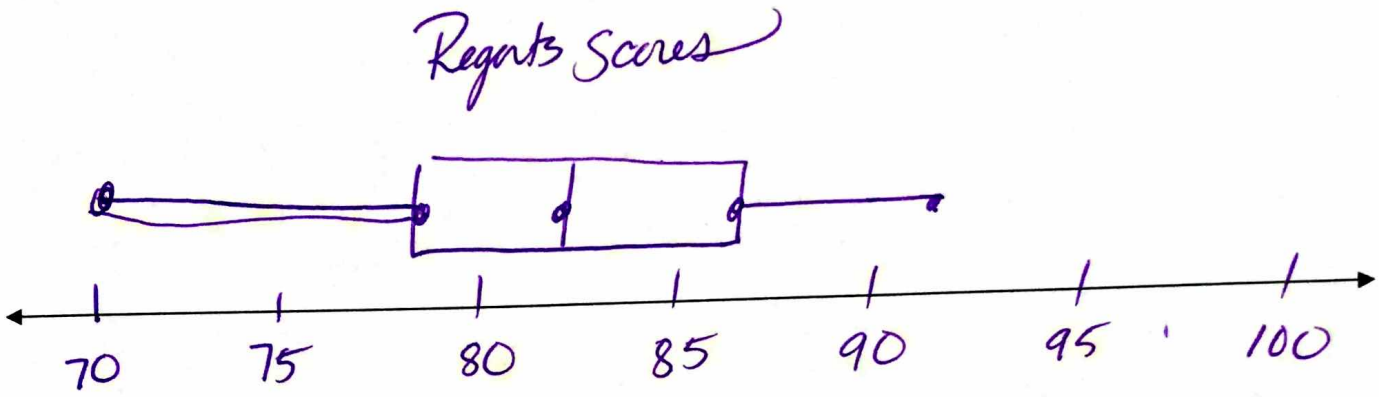
(12)

70, 74, 77, 79, 80, 80, 84, 84, 86, 86, 89, 91

a. Find the five-number summary for the Regents Scores:

Min: 70 Q1: 78 Med: 82 Q3: 86 Max: 91

Create a box and whisker plot of the data set:




14. You are doing a survey about how many hours of homework students do each night. Fill in the following box with an example of each:

(4)

| UNBIASED SURVEY METHOD: | BIASED SURVEY METHOD: |
|---|---|
| ~~Ask~~ 1 boy + 1 girl from each advisory | Asking only AP Calculus students |
| **UNBIASED SURVEY QUESTION:** | **BIASED SURVEY QUESTION:** |
| "How many minutes do ya spend doing HW each night?" | "Ya do <u>all</u> your HW every night, Right?! How long does it take ya!!?" |