SAINT DOMINIC ACADEMY
MATHEMATICS DEPARTMENT

ENTERING AP STATISTICS

2025 SUMMER PACKET

DIRECTIONS

Solve all problems. Show all necessary and complete work in PENCIL.
Write legibly and as neatly as possible.

Cheating is prohibited.

CALCULATOR IS NOT ALLOWED

Name: _____ Signature: _____

AP STATISTICS

Summer Assignment

Please print this packet using both sides of the paper.

Name: _____

I hope you are all enjoying your first few days of summer! Here is your summer work packet for your upcoming Statistics course.

The purpose of this summer work is to review some basic topics from previous math coursework, as well as introduce you to some of the statistical capabilities of the graphing calculator. At least a TI-84 graphing calculator is needed in the course.

Going into AP Statistics, you will find out that the most challenging parts are not the calculations. This is a course that is not just about finding numbers but using them and understanding them which may require you to think about math in a different way than you are used to.

The AP Statistics is a college level course, and the expectation is that you rise to the challenge. Our ultimate goal is that you receive a grade on the AP Exam that will transfer into the college of your choice.

This packet is due on the first day of school in September. It will be graded. You need to get off to a good start so spend some quality time on this packet this summer.

It is a mistake to decide to do this now. Let it go until mid-summer. I want these vocabulary words and some techniques to be relatively fresh in your mind in the fall. Also, do not wait to do them at the very last minute. These take time.

After reading all of the material and sites given you should be able to complete the questions in the remaining pages of this packet. You should do so in the spaces provided.

If you have questions about any of these problems, contact me at the school email address. Have a good summer and see you in the fall.

Be safe, be motivated, do the right thing. Enjoy your summer!

Mrs. Patiak

Part 1: Reading and Vocabulary

You will use a free online Statistical tutoring site and the summer assignment videos below. While reviewing the information on the site and videos, you will be completing a vocabulary list. You may use other online resources.

Summer assignment videos:

SUMMER VIDEO ONE:
https://www.youtube.com/watch?feature=player_detailpage&v=XPmTISOdPJs

SUMMER VIDEO TWO:
https://www.youtube.com/watch?feature=player_detailpage&v=j_Y_0eh-FCQ

Follow the steps below:
1. Go to www.stattrek.com
2. Click on "AP Statistics" then "AP Tutorial"
3. On the left side of the screen is a list of general topics. Under each general topic are a list of subtopics. You will be looking under the major topic "Exploring Data".

Vocabulary List:
Please define each of the following terms from the information on the stattrek website. When asked provide an example.

1. Descriptive Statistics:
   _____
   _____

2. Inferential Statistics:
   _____
   _____

3. Categorical Variables:
   _____
   _____

Example:

4. Quantitative Variables:

Example:

5. Discrete Variables:

6. Continuous:

7. Univariate Data:

8. Bivariate Data:

9. Population:

   Example:

10. Sample:

    Example:

11. Median:

12. Mean:

13. Outlier:

14. Parameter:

15. Statistic:

16. Census:

17. Range:

18. Center:

19. Unimodal:

Sketch:

20. Bimodal:

_____

_____

Sketch:

Part 2: Numerical Descriptions of Quantitative Data

There are two categories of numbers that are used to describe a set of data: measures of center and measures of spread.

Measures of Center:

1. The **Mean** is the average number. It is the sum of all the data values divided by the number (n) of values.

Example: {4, 36, 10, 22, 9} mean = $\bar{X} = \frac{\sum X_i}{n} = \frac{4+36+10+22+9}{5} = 16.2$

2. The **median** is the value that separates the bottom 50% of data from the top 50% of data. It is the middle element of an ordered set of data that is odd in number. It is the average of the two middle elements of an ordered set of data that is even in number.

Example: {4, 9, 10, 22, 36} median is 10

{4, 9, 10, 22, 36, 43} median is $\frac{10+22}{2} = 16$

3. The **mode** is the value that occurs most often in a set of data. If the data occurs with the same frequency, then there is no mode. If two (or more) values occur the most then they are both the mode. We call this bimodal.

Measures of Spread:

1. The **range** is measure of spread of the entire data. It is calculated by subtracting the minimum value from the maximum value.

Ex: {4, 36, 10, 22, 9, 43} = {4, 9, 10, 22, 36, 43} range = 43 - 4 = 39

2. The **interquartile range (IQR)** is a measure of the spread of the middle 50% of the data. It is calculated by subtracting the 25th percentile (Q1) from the 75th percentile (Q3). Q1 is the median of the lower half of the data. It separates the bottom 25% of values from the top 75% of values. Q3 is the median of the upper half of the data. It separates the top 25% of values from the bottom 75% of values. In neither of these cases is the median considered in the top half or the bottom half of the data.

Ex: {4, 9, 10, 22, 36, 43}

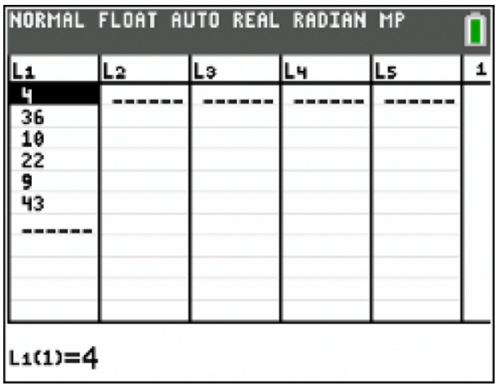
Q1 Q3 IQR = 36 - 9 = 27

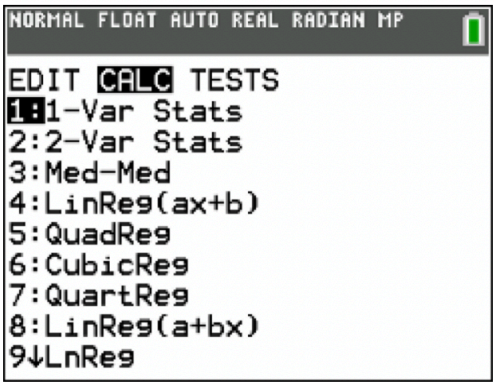
3. The **standard deviation** is the measure of the spread around the mean. It is calculated using the formula:

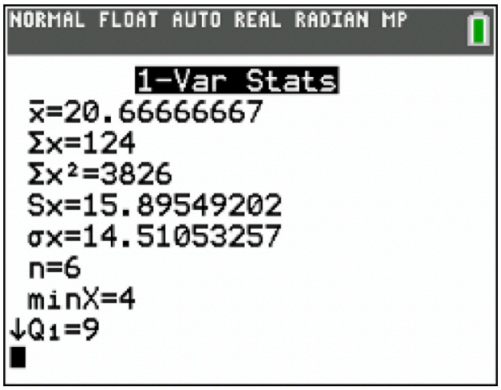
$$s = \sqrt{\frac{\Sigma \left(x_i - \bar{X}\right)^2}{n-1}}$$

Luckily, we don't calculate the standard deviation by hand. It is easier to put the data into List 1 and calculate the 1-VAR STATS.

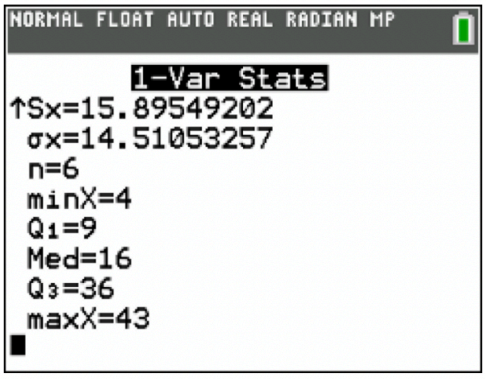
To see statistical results including the quartiles, mean and standard deviation, use STAT CALC 1:1-Var Stats







If you arrow down you will see the rest of the stats.



Part 3: Practice Problems

1. **Categorical or Quantitative:**
   Determine if the variables listed below are quantitative/numerical or categorical/qualitative.

   a. Amount of money earned last week: _____

   b. Arm span: _____

   c. Birthdate: _____

   d. Dominant hand reaction time: _____

   e. Favorite sport: _____

   f. Height: _____

   g. Hours slept per night: _____

   h. Language spoken at home: _____

   i. Foot length: _____

   j. Zip code: _____

   k. State of residence: _____

   l. Travel method to school: _____

   m. Travel time to school: _____

   n. Grade: _____

2 . **Problem:**

Once you answer the question, determine if the data is Quantitative (discreet or continuous) or Qualitative (binary or not binary).

Question:	Answer	Type
1. In what grade did you take Algebra 1?		
2. How many DVD's do you own?		
3. How old was your father when you were born?		
4. What is your zip code?		
5. What score do you want on the AP exam?		
6. How many siblings do you have?		
7. Do you like broccoli?		
8. What is your favorite subject?		
9. What is your gender?		
10. How tall are you (in inches)?		
11. How many AP classes will you be taking this year?		
12. How many cousins do you have?		
13. How long have you lived in your current home?		
14. How far do you live from school?		

3. **Summary Statistics**

A. Here is a list of parents' ages at the time their sons were born

Dad:	41	27	23	31	30	33	26	32	43	25	34	27	25
	34	27	26	28	32	32	35	27	33	34	34	34	35
Mom:	39	26	23	30	28	33	23	32	38	23	35	24	24
	33	24	32	23	30	24	29	34	35	26	31	23	37

Enter these two lists into your calculator and use the 1-Var Stat option to calculate the following:

1. Data for Dad: mean _____ median _____ Which is larger? _____

2. Data for Mom: mean _____ median _____ Which is larger? _____

3. Now compare the two means. Which is larger? _____

4. Is this what you expected? _____Explain why or why not. _____

5. Calculate the standard deviations for both sets of data: Dad _____ Mom _____

   Why might these be different? _____

6. Find Q1 and Q3 and the IQR for Dad: Q1 _____ Q3 _____ IQR _____

   Mom: Q1 _____ Q3 _____ IQR _____

7. A company has two machines that fill cans of soft drinks. Samples from each machine show the following number of ounces per can:

   Machine A: 11.1, 12.0, 11.4, 12.1, 11.7, 11.5, 12.2, 11.4, 11.3, 11.9

   Machine B: 10.9, 12.4, 12.7, 11.8, 12.3, 11.9, 12.0, 12.5, 12.7, 11.6

   Find the mean and standard deviation for both machines.

8. Using your answer to #7, explain which machine is "better" at filling soft drink cans.

B. 1. Determine the given statistics from the data below on the number of homeruns that Mark McGuire hit in each season from 1982-2001.

70	52	22	49	3	32	58	39
39	65	42	29	9	32	9	33

Mean	
Standard Deviation	
Minimum	
Maximum	
Median	
Q1	
Q3	
Range	
IQR	

2. Using the 1.5 IQR Rule, determine if there are any outliers in this data

C. Where do older people live?

This table gives the percentage of residents aged 65 or older in each of the 50 states.

State	Percent	State	Percent	State	Percent
Alabama	13.1	Louisiana	11.5	Ohio	13.4
Alaska	5.5	Maine	14.1	Oklahoma	13.4
Arizona	13.2	Maryland	11.5	Oregon	13.2
Arkansas	14.3	Massachusetts	14.0	Pennsylvania	15.9
California	11.1	Michigan	12.5	Rhode Island	15.6
Colorado	10.1	Minnesota	12.3	South Carolina	12.2
Connecticut	14.3	Mississippi	12.2	South Dakota	14.3
Delaware	13.0	Missouri	13.7	Tennessee	12.5
Florida	18.3	Montana	13.3	Texas	10.1
Georgia	9.9	Nebraska	13.8	Utah	8.8
Hawaii	13.3	Nevada	11.5	Vermont	12.3
Idaho	11.3	New Hampshire	12.0	Virginia	11.3
Illinois	12.4	New Jersey	13.6	Washington	11.5
Indiana	12.5	New Mexico	11.4	West Virginia	15.2
Iowa	15.1	New York	13.3	Wisconsin	13.2
Kansas	13.5	North Carolina	12.5	Wyoming	11.5
Kentucky	12.5	North Dakota	14.4		

Finish the chart of bin widths, then fill in the frequency, relative frequency, and cumulative frequency table columns.

Bin Widths	Frequency	Relative Frequency	Cumulative Frequency
4 to <6			
6 to <8			
8 to <10			