

AP Statistics Summer Work Packet  
DUE AT THE END OF THE FIRST WEEK OF SCHOOL

AP Statistics  
Summer Work Packet

DUE THE LAST DAY OF THE  
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**Welcome to AP Statistics!**

This course is a college-level introductory statistics course. I expect that you will treat this course with the same seriousness and dedication that you would treat a college course.

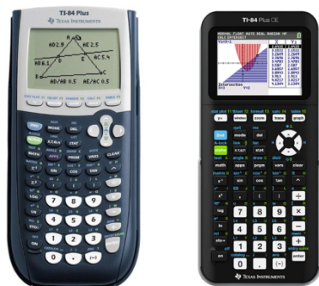
Your **required** summer work includes the following:

- 1) **Read Ch. I** of your AP Statistics book (attached as a pdf). You will be responsible for knowing the big ideas (in the summery at the end of the chapter) and the vocabulary words in bold. You will take a quiz on this material at the end of the second week of class.
- 2) **Complete the attached problems.** These will be graded, so be sure to answer them thoroughly using complete sentences and legible handwriting.

Sign here to state that you completed these problems independently, without assistance from another person, including or use of the Internet. Consider these questions open-note and open-book but not open-friend. Using the attached file or other AP Statistics prep book is acceptable.

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- 3) Complete the **Calculator Skills** section of the packet.
- 4) Purchase a **new or used graphing calculator** of one of the following models: TI-84 Plus, or TI 84 Plus CE. You **must** have a graphing calculator by the first day of class. Non-TI calculators (Casio, HP Prime, etc.) or graphing calculator apps are not acceptable. If purchasing a calculator is a hardship for your family, please let me know as soon as possible so that we can determine a workable solution. *You will need this calculator in class and at home daily. Waiting until midway through the year to purchase or talk with me about this need is not acceptable.*



- 5) Purchase an **AP Statistics test prep book**. Kaplan, Princeton Review, 5 Steps to a 5, or Barron's are all good books and are easily available. If purchasing a calculator is a hardship for your family, please let me know as soon as possible so that we can determine a workable solution.

AP Statistics Summer Work Packet  
DUE AT THE END OF THE FIRST WEEK OF SCHOOL

**AP Statistics practice free-response questions:**

- 1) Five hundred randomly selected 16-year-old students from a large school district took a health-education course that focused on stress reduction and mindfulness. Prior to the course, each student took a 10-question pre-test about their knowledge on the subject. Following the course, each student took a 10-question post-test on the material. Their scores appear in the frequency table below. For example, 4 students earned a score of 1 on the pre-test, and 17 students earned a score of 1 on the post-test.

Score	Pre-Test Frequency	Post-Test Frequency
1	4	17
2	17	31
3	29	49
4	39	71
5	54	70
6	69	87
7	78	83
8	54	93
9	34	73
10	9	39

- a. Display these data graphically so that the pre-test scores and post-test scores can be easily compared.
- b. Based on an examination of your graphical display, write a few sentences comparing the pre-test scores and post-test scores in this population.

AP Statistics Summer Work Packet  
DUE AT THE END OF THE FIRST WEEK OF SCHOOL

- 2) The summary statistics for the number of bagels sold per day at the Latin school store for 117 days in school year 2018 – 2019 are shown below.

N	MEAN	MEDIAN	STDEV	SE MEAN	MIN	MAX	Q1	Q3
117	14.941	13.070	6.747	0.624	4.850	38.180	9.680	19.250

- a. Describe a procedure that uses these summary statistics to determine whether there are outliers.

- b. Are there outliers in these data? \_\_\_\_\_

Justify your answer based on the procedure that you described in part (a).

- c. The School Store managers reported that on a particular day, the store sold only 10 bagels. Use the information provided to comment on this reported statement.

AP Statistics Summer Work Packet  
DUE AT THE END OF THE FIRST WEEK OF SCHOOL

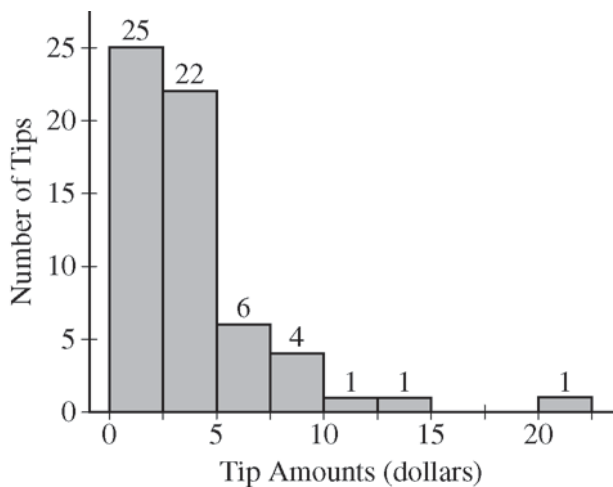
- 3) During Lion Day, 50 juniors and 50 seniors completed a relay race. Descriptive statistics for the completion times (in minutes) for the two groups are shown below.

	Students	Faculty Members
Mean	9.90	12.09
Median	9.25	11.00
Minimum	3.75	4.50
Maximum	16.50	25.00
Lower quartile	6.75	8.75
Upper quartile	13.75	15.75

- a. Use the same scale to draw boxplots for the completion times for juniors and for seniors.
- b. Write a few sentences comparing the variability of the two distributions.
- c. You have been asked to report on this event for the school newspaper. Write a few sentences describing junior and senior performances in this competition for the paper.

AP Statistics Summer Work Packet  
DUE AT THE END OF THE FIRST WEEK OF SCHOOL

- 4) Madison spends her summers working as a server in a restaurant, where she can earn a tip from each customer she serves. The histogram below shows the distribution of her 60 tip amounts for one day of work.



- a. Write a few sentences to describe the distribution of tip amounts for the day shown.
- b. One of the tip amounts was \$8. If the \$8 tip had been \$18, what effect would the increase have had on the following statistics? Justify your answers with words and/or calculations.

The mean:

The median:

AP Statistics Summer Work Packet  
DUE AT THE END OF THE FIRST WEEK OF SCHOOL

**AP Statistics Calculator Skills:**

Watch [this video](#) on calculator functions for the AP Statistics exam (Google “AP Statistics Calculator Review Ti84 AP STATS” by the Algebros). Bookmark this video so that you can refer to it throughout the year. There will likely be some measurements that you have never heard. That is fine. Right now, we are working on becoming comfortable with your calculator.

Complete the following problems:

- 1) Students measured their heart rates before and after drinking a sugary soda. The data are below. Use your calculator to find the mean, standard deviation, median, and IQR of the data.

Student	Heart Rate Before Soda
1	72
2	67
3	68
4	75
5	62
6	59
7	86
8	86
9	79
10	70

mean  $\bar{x}$ : \_\_\_\_\_

standard deviation  $S_x$ : \_\_\_\_\_

median: \_\_\_\_\_

IQR: \_\_\_\_\_

- 2) Sketch a boxplot of the data below. Make sure to include a scale.

AP Statistics Summer Work Packet  
DUE AT THE END OF THE FIRST WEEK OF SCHOOL

3)

Student	Heart Rate Before Soda	Heart Rate After Soda
1	72	78
2	67	71
3	68	80
4	75	78
5	62	68
6	59	66
7	86	92
8	86	89
9	79	85
10	70	77

a. Find the correlation  $r$  between these two variables. \_\_\_\_\_

b. Find the equation of the regression line (“linreg”) \_\_\_\_\_

4) Sketch a scatterplot of the data above. Make sure to include a scale.

5) Sketch a residual plot for the data above. Make sure to include a scale.

6) Find the residual ( $y$ -value) for the data point that has an  $x$  value of 67.



AP Statistics Summer Work Packet  
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- 7) Calculate a  $\chi^2$  (chi-squared) test for the data in this table using a matrix that is a  $10 \times 2$ . Write your values below:

Heart Rate Before Soda	Heart Rate After Soda
72	78
67	71
68	80
75	78
62	68
59	66
86	92
86	89
79	85
70	77

$\chi^2$  \_\_\_\_\_

df: \_\_\_\_\_

p: \_\_\_\_\_

- 8) Now calculate a  $\chi^2$  GOF (chi-squared goodness-of-fit) test for the data in this table using the data below for  $L_1$  and  $L_2$  and 9 degrees of freedom ( $df = 9$ ). Write your values below:

Heart Rate Before Soda	Heart Rate After Soda
72	78
67	71
68	80
75	78
62	68
59	66
86	92
86	89
79	85
70	77

$\chi^2$  \_\_\_\_\_

df: \_\_\_\_\_

p: \_\_\_\_\_

AP Statistics Summer Work Packet  
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