

AP Statistics 2017-2018

Welcome to AP Statistics. We look forward to working with you next year. We anticipate our journey through Statistics to be an exciting and interesting one. Statistics is a Math course that involves discovering a variety of ways to collect, analyze and interpret data.

The Course Topics are as follows:

1. Exploring Data: Observing Patterns and departures from patterns
2. Planning a Study: Deciding what and how to measure
3. Anticipating Patterns: Producing Models using probability theory and simulation
4. Statistical Inference: Confirming Models

Your Summer Assignment:

Complete the packet which involves using your calculator to make a box plot and a scatter plot with a line of best fit, and a number of Algebra 1 & 2 Review questions. Please bring the assignment with you on the first day of class.

The second part of your summer assignment involves reading the first chapter of your textbook and answering some questions.

Please realize that Advanced Placement Statistics is a college level course and as such will require you to work hard and devote a good bit of time (AT HOME) to reading the text and completing homework assignments. Don't get me wrong – the class is fun, but challenging as well, especially in the second half of the year.

First Day of Class:

Bring your calculator, your textbook, your notebook and a 1.69 ounce (unopened) bag of regular M&Ms.

See you in August!

Ms. Daubert
Mrs. Hector

Summer Assignment for AP Statistics – Part 1

DUE: First Day of Class, 2017

Statistician: _____

Required for class and homework, every day:

- Calculator: any from the TI-83 or TI-84 family
- Binder with loose-leaf paper
- Graph paper
- Pen and pencil
- Ruler

Summer Activities

- *Please note that the calculator directions given are for a TI-83 Plus.*
- *You are required to show work for all questions, unless you are specifically instructed to use the calculator.*

Before beginning the tasks assigned below, perform the following operations in your calculator.

1. Select CATALOG (2nd, 0).
 2. Press the letter D. (Use the x⁻¹ key. Since there is an "A" in the upper right corner of your screen, that means that you will be selecting the green "ALPHA" function of the key. That selection will allow you to jump to the D's in the catalog, rather than having to scroll through A, B, and C to get there.)
 3. Scroll down (use the down arrow key) to find "DiagnosticOn."
 4. Hit enter to select it, then hit enter again to actually perform the function.
- Your calculator will now display information that you will need to access. If you clear the memory on your calculator at any point, you'll need to repeat this process.
 - Always begin a procedure in the calculator from a blank "home screen." (The "regular" screen, where you can perform arithmetic operations.)

I. Stat Button use:

Enter the following data into List 1.

1. Select the STAT menu.
2. Choose "Edit."

510 510 510 543 454 438 459 459 498 466 448 403 498 466 498 433
454 454 498 419 415 454 407 498 443 448 498 433 459 459 419

Sequence of buttons: Stat, Calc, 1-Var Stats, L1

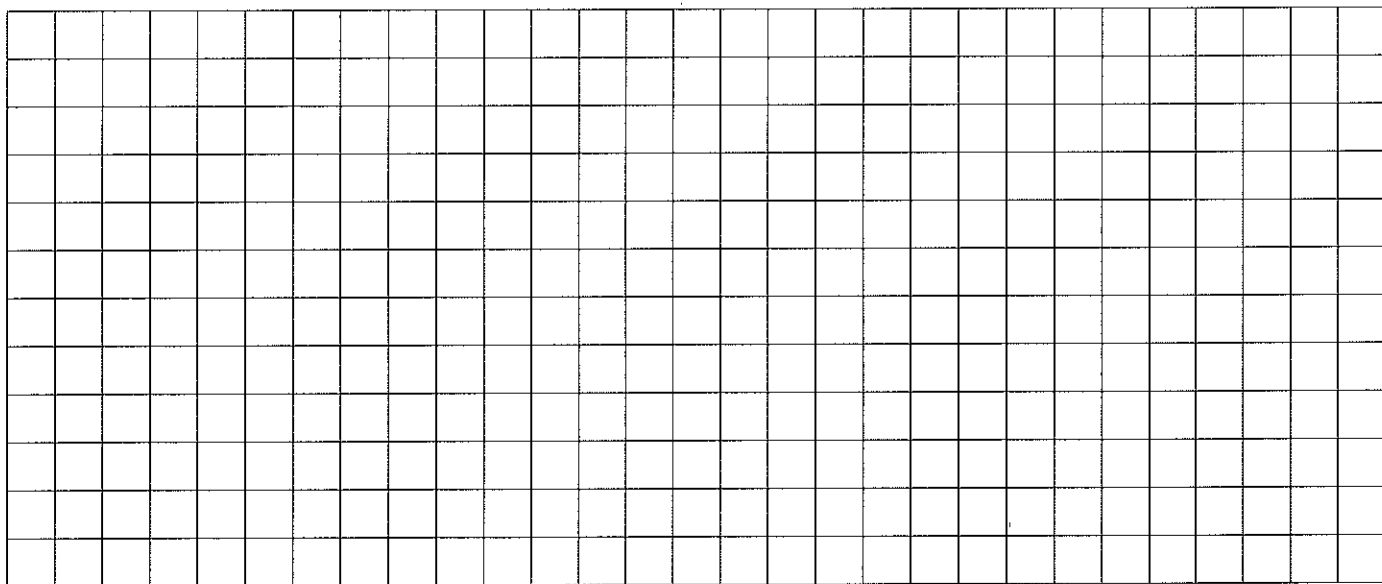
Record the following (Refer to the manual to see which symbol is which statistic)

- Mean -
- standard deviation (s, not σ) -
- n -
- Min -
- Q1 -
- Median -
- Q3 -
- Max -

II. Using the Statistics Plot

1. Select **Stat Plot** (2nd Y=).
2. Hit Enter to select Plot 1.
3. Toggle cursor to "On," by hitting Enter.
4. Select the fourth plot (a box plot with outliers) by hitting Enter.
5. Your data should be in List 1, so x-list should read "L1."
6. Select "Zoom" (3rd button, top row).
7. Choose option 9 (ZoomStat).

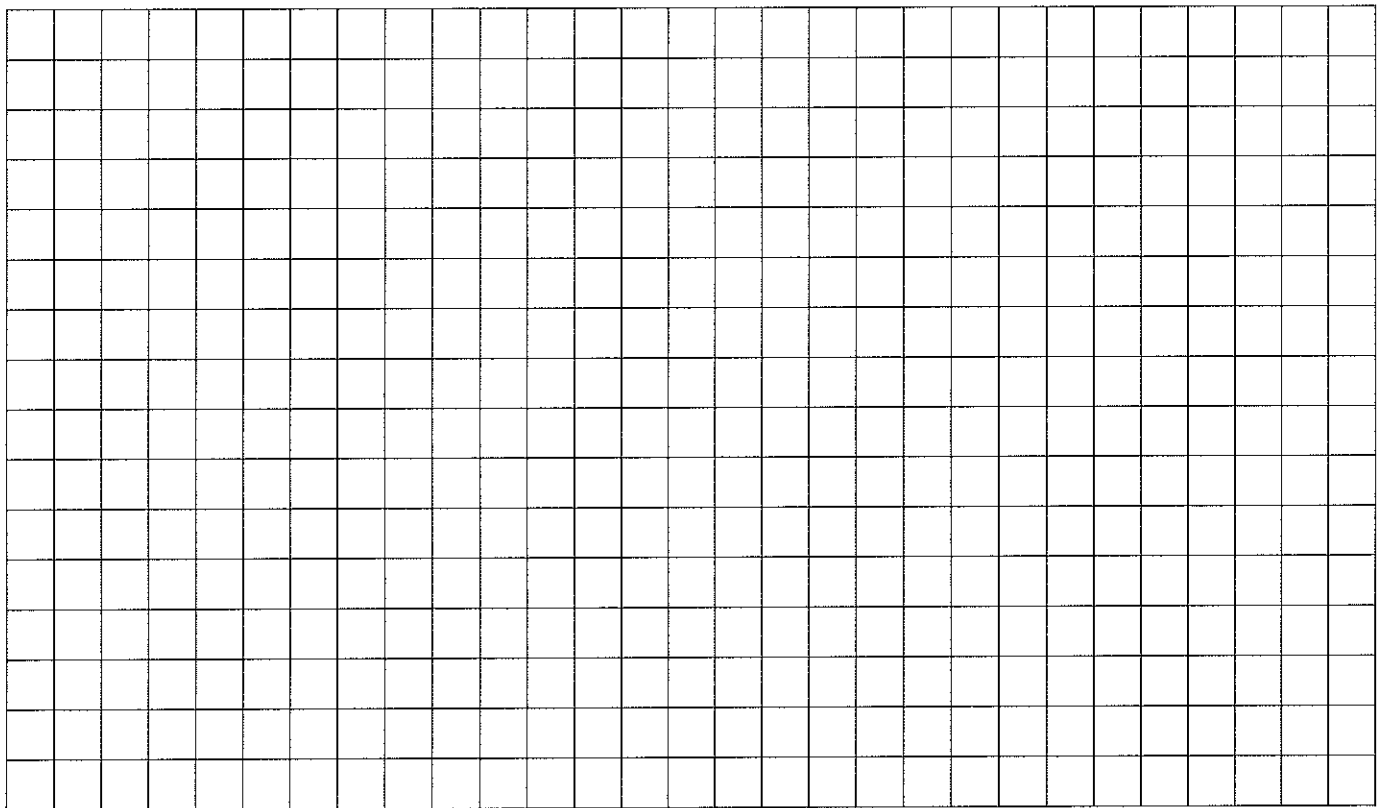
Reproduce the box plot in scale here. Use trace to find the end of the whisker and the ends of the box and the middle line on the box. Label your x-axis and scale. Choose a scale appropriate for the space provided.



III. Practice with regression: If you are camping in the woods, can you tell what the temperature is (y) if you know how fast a cricket chirps?

Chirps/Min	Temperature (C)
110	18
110	19
130	20
135	21
154	23
158	24
179	26
201	29
210	31
230	32

Enter this data into L2 and L3. Plot a scatterplot (the first choice in the plots, 2nd Y= again). Reproduce the scatterplot with labeled axes, scale and a title. Choose a scale appropriate for the space provided. Remember to change the x-and y-lists to L2 and L3!



Now find the line of best fit using these commands: Stat-Calc-8-L2,L3.

Record the equation of the line along with r and r²:

If there were 190 chirps per minute, what would you predict the temperature to be?
(Don't forget units.)

IV. Algebra I & II Review

Show all work on a separate sheet. Give answers on this page.

1. Solve for the variable.

a) $4(x - 2) = 3^2 - x$

b) $\frac{1}{3}n + 3 = n - 2$

c) $9(2p + 1) - 3p > 4p - 6$

d) $\frac{2}{3}y = \frac{8}{27}$

e) $(q - 12)3 \leq 5q + 2$

f) $\frac{m}{12} + \frac{5}{6} = \frac{5}{24}$

g) $\frac{1}{2}x^2 - 8 = 0$

h) $-3x^2 + 343 = 0$

i) $x^2 - 8x + 7 = 0$

j) $2\sqrt{x + 9} = 21$

k) $\sqrt{2x + 10} = x + 1$

2. Write equations of the horizontal and vertical lines that pass through the point $(-3, 4)$.

Horizontal: _____

Vertical: _____

3. Find the slope and y-intercept of the line.

a) $y = \frac{2}{3}(2x - 4)$

b) $3x + 2y = 14$

c) $\frac{1}{3}y - 6x = 4$

4. Find the slope and write the equation of the line containing the given points.

a) $(6, -2)$ and $(0, 5)$

b) $(8, -5)$ and $(3, 4)$

5. On graph paper, plot the data given. Describe the data as linear, exponential, quadratic, or absolute value.

a. $(-3, 4)$ $(-2, 3\frac{1}{2})$ $(-1, 3)$ $(0, 2\frac{1}{2})$ $(1, 2)$ $(2, 1\frac{1}{2})$ $(3, 1)$ _____

b. $(-3, 4)$ $(-2, 3)$ $(-1, 2)$ $(0, 1)$ $(1, 2)$ $(2, 3)$ $(3, 4)$ _____

c. $(-3, 4)$ $(-2, 2)$ $(-1, 1)$ $(0, \frac{1}{2})$ $(1, \frac{1}{4})$ $(2, \frac{1}{8})$ $(3, \frac{1}{16})$ _____

d. $(-3, 4)$ $(-2, \frac{7}{3})$ $(-1, \frac{4}{3})$ $(0, 1)$ $(1, \frac{4}{3})$ $(2, \frac{7}{3})$ $(3, 4)$ _____

6. For each function, find $f(x)$ for $x = -3, 0,$ and 2

a. $f(x) = 4x - 2$

b. $f(x) = 3x^2$

$f(-3) =$ _____

$f(-3) =$ _____

$f(0) =$ _____

$f(0) =$ _____

$f(2) =$ _____

$f(2) =$ _____

7. Evaluate $g[f(-2)]$ and $f[g(3)]$ for each of the following functions.

a. $f(x) = 3x; g(x) = 2x + 3$

b. $f(x) = -x; g(x) = x^2 + 5$

$g[f(-2)] =$ _____

$g[f(-2)] =$ _____

$f[g(3)] =$ _____

$f[g(3)] =$ _____

This assignment counts as a homework grade.

Summer Assignment for AP Statistics – Part 2

DUE: First Day of Class

Mathematician: _____

Summer Activities

- Read Chapter 1 of your Statistics textbook **The Practice of Statistics**.
- Completely and carefully answer each question on the Chapter Outline.
(These aren't intended to torture you, but rather to help guide your reading.)
- Turn the Chapter Outline in on the first day of class.

My hope is that this second assignment will enable us to “hit the ground running” when school begins. The feedback that I have gotten from former students is that we need to move quickly through the first part of the course and allow ample time for in-depth coverage and practice of the difficult material that comes later in the course.

I also hope that beginning to read the textbook will help you realize what a helpful resource the book is going to be. It is my belief that you will find the book to be easy to read and understand. Many real-world examples and applications are included. I was lucky enough to be able to attend a workshop given by one of the authors of the textbook, Dave Bock. As I read the book, I find that it seems to be in his voice. He seems to be casually introducing and explaining concepts to you as you read. **Get to know this book** – it contains all the information necessary for you to learn in order to become a statistical thinker and get college credit for this course.

ENJOY YOUR READING! (And don't wait until September to begin.)

This assignment counts as a homework grade.

Chapter 1: Exploring Data

Key Vocabulary:

- | | | |
|----------------------------|-------------------------|-----------------------|
| ▪ individuals | ▪ shape | ▪ median |
| ▪ variable | ▪ skewed left | ▪ resistant |
| ▪ categorical variable | ▪ skewed right | ▪ quartiles |
| ▪ quantitative variable | ▪ symmetric | ▪ Q_1, Q_3 |
| ▪ two way table | ▪ dot plot | ▪ IQR |
| ▪ marginal distributions | ▪ histogram | ▪ five-number summary |
| ▪ conditional distribution | ▪ stemplot | ▪ minimum |
| ▪ association | ▪ split stems | ▪ maximum |
| ▪ distribution | ▪ back-to-back stemplot | ▪ boxplot |
| ▪ range | ▪ time plot | ▪ modified boxplot |
| ▪ spread | ▪ mean | ▪ standard deviation |
| ▪ frequency | ▪ Σ | ▪ variance |
| ▪ outlier | ▪ \bar{x} | |
| ▪ center | ▪ nonresistant | |

INTRO Analyzing Categorical Data (pp.2-6)

1. How is statistics defined?
2. Define data analysis.
3. Define individual.
4. Define variable.
5. What is a categorical variable?
6. What is a quantitative variable?
7. Define distribution.

8. How should data be explored?

9. Drawing conclusions that go beyond the given data is referred to as _____.

10. What are the two primary ways to produce data?

1.1 Displaying Distributions with Graphs (pp.8-21)

1. What is the difference between a frequency table and a relative frequency table?

2. What type of data are *pie charts* and *bar graphs* used for?

3. Pie Charts can only be used when?

4. How is a two-way table setup?

5. Which is more informative when comparing group counts or percents? Why?

6. Explain the four step process to organizing a statistical problem.

7. What do you need to be cautious of when variables seem to have a strong association?

1.2 Describing Distributions with Numbers (pp.27-42)

8. How do you make a dot plot?

9. When examining a distribution, you can describe the overall pattern by its

S_____

O_____

C_____

S_____

10. If a distribution is *symmetric*, what does its dot plot look like?
11. If a distribution is *skewed right*, what does its dot plot look like?
12. If a distribution is *skewed left*, what does its dot plot look like?
13. What is the difference between unimodal, bimodal, and multimodal data?
14. How do you make a *stemplot*?
15. When is it advantageous to split stems on a stemplot?
16. When is a *back to back stemplot* useful?
17. How is the *stemplot* of a distribution related to its histogram?
18. What is a *histogram*?
19. When is it better to use a *histogram* rather than a *stemplot* or *dotplot*?
20. What is meant by *frequency* in a histogram?
21. What is the difference between a *bar-graph* and a *histogram*?
22. Define *outlier*.

1.3 Describing Quantitative Data with Numbers (pp.50-69)

1. In statistics, what are the most common measures of center?
2. Explain how to calculate the *mean*, \bar{x} .

3. Explain how to calculate the *median*, M .
4. Explain why the median is *resistant* to extreme observations, but the mean is *nonresistant*.
5. In a symmetric distribution where are the mean and median in relation to each other?

What about in a distribution that is skewed?

6. What is the difference between "*average*" value and "*typical*" value?
7. Explain how to calculate Q_1 and Q_3 and *IQR*.
8. When does an observation become an *outlier*?
9. What is the *five-number summary*?
10. How much of the data falls between each quartile?
11. How much of the data falls between Q_1 and Q_3 ?
12. Describe a *boxplot*.
13. What does *standard deviation* measure?
14. What is the relationship between *variance* and *standard deviation*?
15. When does *standard deviation* equal zero?
16. What are the units for the standard deviation of a distribution?

17. Is *standard deviation* resistant or nonresistant to extreme observations? Explain.

18. Use a five number summary when...

19. Use \bar{x} and s when...