AP Statistics Summer Assignment '15-'16

Welcome to AP Statistics. This course will be unlike any other math class you have ever taken before! Before taking this course you will need to be competent in basic algebra, be familiar with basic statistical plots (box-and-whiskers plots, scatter plots, bar graphs, histograms, circle (pie) graphs, and stem-and-leaf plots), and you must be willing to explain your answers, not just simply get the correct answer. In this class you will learn to describe and analyze sets of data and use that analysis to draw conclusions about the situations that gave that data.

At the beginning of the year, you will be assigned a textbook. In addition to this textbook, you will be required to have access to ***5 Steps to a 5 on the AP: Statistics*** by Duane Hinder, 2014-2015. Don't be afraid to shop around online and find a good deal, even if it is a used book….just make sure you have the 2014-2015 version. If you end up with a different year, just make sure you math the pages up with a friends.

Also required for this class will be a graphing calculator that you can have at home and in this class on a daily basis. A TI-83 is the minimum calculator needed for this course; although, a TI-84 is better, as the TI-83 does not do everything required for this course. You may already own or choose to buy a different brand (Casio, HP, etc), but I will only be teaching how to use a TI calculator. Whatever calculator you buy, make sure it is capable of performing the following:

Statistical plots - box and whisker, modified box and whisker, histogram, scatter plot
Regression equations and correlation statistics
Distribution & probability density functions - normal, binomial, and geometric
Statistical tests - t, z, χ^2, and confidence intervals

Every student in this class will be required to complete a summer assignment, which will be **due the first day of school**. The purpose of this assignment is to ensure that you enter this course with the required background knowledge in order to be successful. All answers must be on your own paper and legible. Be careful with spelling, sentence structure, and grammar. A large part of this class is clear communication of your answers. This is four-part assignment. Please make sure to bind your work in a pocket folder or report cover, with your name clearly marked on every page. This is worth a test grade and any missing part will result in a major deduction of your grade. If you have any questions, please feel free to email at Zpodkomo@pasco.k12.fl.us .

Part I: Why Statistics?

Write a page explaining why high school students should take a statistics class. First, use evidence from the following sources to make your case:

· http://www.ted.com/talks/lang/eng/arthur_benjamin_s_formula_for_changing_math_educatio n.html (http://tinyurl.com/nw8uyo)

· http://www.wired.com/magazine/2010/04/st_thompson_statistics/

Then, write a paragraph explaining what you hope to gain from taking a class in Statistics. What are your reasons for signing up for this class?

******You should've purchased a 5 Steps to a 5 by this point. For information on this, please see the first page of this assignment. Before starting the rest of the assignment, please read Ch. 5 (p.53-58), Ch.6 (p. 59-78), and Ch. 7 (p. 93-102).**

Part II-Vocabulary:

Define all bolded words in the reading and make flash cards for each one. I will not collect these flash cards, but we will have a quiz on these words on the first Friday of school, August 23rd.

Part III-Problems:

1. *Categorical or Quantitative Data?*
    a. *Number of students in a classroom*
    b. *Sex of students in a classroom*
    c. *Height of students in the classroom*
    d. *Temperature in the classroom*
    e. *Age*
    f. *Smoke or Not*
    g. *Republican, Democrat, or Neither*
    h. *Colors of the Rainbow*
    i. *Grade you are in*
    j. *Whether you are a freshman, sophomore, junior, or senior*

2. *Data Analysis*
    In a rural town in Oklahoma during the 1970's, the following data was collected concerning the age at which the eldest child in a family to get his/her license. The sample consists of 31 people, 16 males (M) and 15 females (F).

M	16	16	17	16	18	17	17	16	16	27	16	17	16	17	16	16
F	17	18	19	20	18	19	20	18	18	17	16	18	19	17	18	

a. *Calculate the following statistics for the male and female data separately.*
    i. *Mean*
    ii. *Median*
    iii. *Mode*
    iv. *Range*
b. *Plot each set of data. Either use a stem-and-leaf plot or a dot plot.*
c. *Looking at your plot, which data point(s) would be considered an outlier?*
d. *Re-calculate part (a) above for the males, excluding the outlier if there is one.*
e. *Summarize the effects of the outlier on the mean, median, mode, and the range.*
f. *In statistics, often you will be required to interpret your data. In a paragraph, compare the two sets of data.*

3. *The following data describes the number of persons per household in the United States in the census years between 1850 and 2000.*

Year	# of persons in household
1850	5.55
1860	5.28
1870	5.09
1880	5.04
1890	4.93
1900	4.76
1910	4.54
1920	4.34
1930	4.11
1940	3.67
1950	3.37
1960	3.35
1970	3.14
1980	2.76
1990	2.63
2000	2.59

a. *Construct a scatter plot of this data on graph paper. Put year on the x-axis and household size on the y- axis. Clearly label the axis, and give the graph a title.*
b. *Using a straight edge or a ruler, carefully draw a line of best fit through the data.*
    i. *Estimate the slope of your best-fit line. Include proper units for your slope.*
    ii. *Use your graph and best-fit line to estimate the number of persons in a household in 2010.*

4. Suppose a set of data consists of 33 whole number observations. Its five number summary is (min, Q1, median, Q3, max)=(16, 20, 22, 30, 46). (This problem refers to box and whisker plots)

a. *What is the range of the data?*
b. *How many observations are strictly less than 22?*
c. *Is it possible that there is no observation equal to 22? (explain briefly)*
d. *How many observations are strictly less than 20?*
e. *Is it possible that there is no observation equal to 20? (explain briefly)*
f. *Construct a modified box plot.*

Part III: Using your TI Graphing Calculator

Entering data into a list:

STAT -> 1: Edit -> Enter data into appropriate list

To clear a list:

Scroll up to the list name and hit clear followed by the down arrow.

To sort a list in ascending order:

STAT->2: Sort A (L1) (go back to STAT->1: Edit to see your sorted list)

To find the mean of a list:

2nd STAT -> Math -> 3: mean (L1)

To find the median of a list:

2nd STAT -> Math -> 4: median(L1)

12	18	33	15	66	43	26	42	22	4	17	54	44	52	38	27	25	44	18	25	42	63	38	36	44
19	58	30	14	46	21	34	54	23	44	55	60	39	62	33	28	53	35	55	44	21	55	50	33	9

1. *Use the above data to do the following exercises:*
2. *Enter the data into a list (preferably L1).*
3. *Sort the list in ascending order and find the mode.*
4. *Find the mean of the data.*
5. *Find the median of the data.*
6. *Find the sum of the data.*
7. *Find the Standard Deviation (stdDev( ) of the data.*

Part IV: Must Know the Basics (Show work when necessary)

1. *Write 7% as a decimal.*
2. *Write 3/10 as a percent.*
3. *What is 25% of 500?*
4. *What is 12% of 82?*
5. *What is the probability of rolling a number greater than a 2 when rolling a fair 6-sided dice?*

6. *What does 3<x<20 mean if you were to put in words?*
7. *G(x) = 3x-5, find G(8).*
8. *Solve the following for z: b= r(z) + g*
9. *Solve the following for z: b= r(z) + z*
10. *Graph y=4x+3*
11. *Graph y=3–5x*
12. *Graph y = 22.4 + 6.8x*
13. *If the height of a human in inches is linearly related to their age in years, what would be the interpretation of a slope of 5.67?*
14. *Suppose that the scenario in #13 was represented by the equation A=18.4+5.67h. What is the value 18.4 represent in the real world?*

*****It is very important that you complete this assignment in a timely manner. Do not procrastinate. It is okay to ask others for help or to share ideas, but it is in no way okay to copy each others work. Remember cheating results in a zero and this assignment is worth a test grade. That would be an awful way to start out the school year! Amidst all your summer assignments, most importantly don't forget to enjoy your summer! See you the first day of school!**