## AP Summer Assignment

**Course:** AP Statistics

<table>
<thead>
<tr>
<th>Assignment title</th>
<th>Pre-Work for AP Statistics</th>
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<tbody>
<tr>
<td><strong>Date due</strong></td>
<td>The first day of class</td>
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<tr>
<td><strong>Estimated time for completion</strong></td>
<td>2-3 hours</td>
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</table>
| **Resources needed to complete assignment** | ☐ Textbook assigned by school  
☐ Book(s) supplied by student  
☒ Other supplies: TI-84 or NSpire Graphing Calculator and Pre-Work Problems |
| **How the assignment will be assessed** | Assignment will count as a test grade. Assignment must be completed independently. |
| **Purpose of assignment** | ☒ Review foundational material/concepts/skills.  
☒ Expose students to required material/concepts/skills/texts that cannot entirely be covered during the academic year.  
☐ Have students read material that will be discussed or used in class at the beginning of the year. |
Pre-Work for AP Statistics

This assignment counts as a test grade. For each component that is missing a major deduction will occur.

Required for class and homework, every day:
· Graphing calculator, preferably one from the TI-84 family
· Binder with loose-leaf paper

Summer Activities
· Please note that the calculator directions given are for a TI-84 with operating system 2.55 or higher. Screen shots originate from a TI-84 Plus CE.
· Complete all work in this packet, rather than on other paper.

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

In the menu, turn the statistical diagnostics on by highlighting the indicated option, then .

· Exit the menu using , which will bring you back to the home screen, which is where you should always begin calculator procedures.

I. Stat Functions use:

Entering data in lists.
1. Select the menu.
2. Choose: and enter the following data in L1:

```
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
```

Double-check the number of values you entered as well as the values themselves!

3. Instruct the calculator to find the statistics for this single variable:

```
stat
EDIT CALC TEST
L1 1-Var Stats
```

4. Record the following:

\[ \bar{x} : \text{mean} = \]
\[ \sum x : \text{sum of the values} = \]
\[ S_x : \text{standard deviation of this sample} = \]
\[ n : \text{number of values} = \]
\[ \text{MinX: smallest value} = \]
\[ Q1: \text{value at the 25th percentile} = \]
\[ \text{Med: median} = \]
\[ Q3: \text{value at the 75th percentile} = \]
\[ \text{MaxX: largest value} = \]

Recommended:
· Graph paper
· Pen, pencil, highlighter, dry erase marker
· A review book for the AP Statistics Exam
II. Using the Statistics Plots:

1. Select \(\text{2ND} \rightarrow \text{Y=}\) .
2. Use \(\text{enter}\) to select Plot 1.

3. a) Toggle cursor to “On,” with \(\text{enter}\) .
   b) Select the fourth plot (a box plot with outliers), with \(\text{enter}\) .
   c) Your data should be in List 1, so x-list should read “L1.”
   d) Use whatever mark and color you would like.
4. Select \(\text{2ND} \rightarrow \text{ZOOM}\) then option 9: \(\text{ZOOMSTAT}\)
   so your calculator will fit the data from the selected list on-screen.
5. 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 and use a scale of fives, beginning at 400. Label all approximated values.** Title your graph.

III. More with Stat Plots: If you are camping in the woods, can you tell what the temperature is if you know how fast a cricket chirps? Be sure to use chirps/minute as x and temperature as y.

<table>
<thead>
<tr>
<th>Chirps/Min</th>
<th>Temperature (C)</th>
</tr>
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<tbody>
<tr>
<td>110</td>
<td>18</td>
</tr>
<tr>
<td>110</td>
<td>19</td>
</tr>
<tr>
<td>130</td>
<td>20</td>
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<td>201</td>
<td>29</td>
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<td>210</td>
<td>31</td>
</tr>
<tr>
<td>230</td>
<td>32</td>
</tr>
</tbody>
</table>
3. Reproduce the scatterplot with scale and titled axes. Use a scale appropriate for the space provided. Indicate any breaks in your scale. Breaks may occur only at the beginning of an axis.

IV. Practice with regression:

1. Now find the line of best fit:

Don't forget to again change the list names again, as you did in the Stat Plot.

2. Record the values given by the calculator, rounded to thousandths:

   a:  
   b:  

   r:  
   r^2:  

3. The equation of your prediction line should be written in context. Fill in the blanks below with words or numbers, as appropriate:

   \[
   \text{predicted } y\text{-variable} = \text{y-intercept} + \text{slope} (\text{x-variable})
   \]
4. Using the equation above, predict the temperature for 190 chirps per minute. *Work and units are required.*

5. In the context of this problem, what does each of these values represent? 
*Be sure to include numbers and units.*
   a) the y-intercept
   b) the slope

**V. Review of Algebraic Skills, Mathematical Thinking, and Attention to Detail**

1. Find the equations of the horizontal and vertical lines that pass through the point (-3, 4).
   
   Horizontal: 
   Vertical: 

2. Find the equation of the line using the given information: slope: 5.25, through (6.71, -2.53)

3. Write the terms of the given sequence: 
   a) \(\sum_{x=1}^{5}(x^2 + 2)\) 
   b) \(\sum_{x=1}^{n}(x)\)

4. Solve for the variable: 
   a) \(2.54 = \frac{x - 6}{.12}\) 
   b) \(1.96\sqrt{\frac{.21}{n}} < .116\)

5. Solve for y: 
   a) \(\log y = 5.23 + .27x\) 
   b) \(\ln y = .0067 + 1.49\ln x\)

6. Find the value of y in the equation from 5b, for \(x = 35\)

7. Evaluate each expression for the given values. *Show the substitution step, in addition to the answer.*
   a) \(z = \frac{x-x}{s}\) when \(x = 83, \bar{x} = 91\) and \(s = 14\)
8. a) The percentage 3% is equivalent to what decimal: (A) 30 (B) 3 (C) 0.3 (D) 0.03 (E) 0.003
   
   b) The decimal 0.5 is equivalent to what percentage: (A) 50% (B) 5% (C) 0.5% (D) 0.05% (E) 0.005%
   
   c) 0.16% is equivalent to which of the following: (A) 16% (B) 16 (C) 0.16 (D) 0.016 (E) 0.0016

9. Choose the correct words to complete each sentence:
   
   a) 0.04 is __________ 0.01 (A) Less than (B) Equal to (C) Greater than
   
   b) 0.028 is __________ 0.05 (A) Less than (B) Equal to (C) Greater than
   
   c) 0.2 is __________ 0.05 (A) Less than (B) Equal to (C) Greater than
   
   d) 3.254 \times 10^{-16} is __________ 0.01 (A) Less than (B) Equal to (C) Greater than

10. Suppose there are 50 people in the room, of which 13 are male. Suppose 7 of the males in the room are each wearing a baseball hat. Give unsimplified fractional answers.
   
   a) The proportion of males in the room is:
   
   b) The proportion of males that are wearing a baseball hat is:
   
   c) Out of the whole room, the proportion of baseball-hat-wearing males is:

11. Suppose the following shape is perfectly symmetric, left-to-right, and suppose the total area of the entire shape is 100 units$^2$. If the area of the central, shaded portion labeled “P” is 75 units, what calculation gives the area of just the right-side portion labeled “Q”? Show your work.

12. Suppose I record the number of people in a bus over several minutes, so that the output, y, “number of people” is a linear function of the input, x, “time” (in minutes). If the y-intercept is 5, this means:
   
   (A) When I began, my watch read “5 minutes”.
   
   (B) When I began, there were 5 people on the bus.
   
   (C) As each minute goes by, the number of people increases by 5.
   
   (D) As each minute goes by, the number of people decreases by 5.
13. Suppose I place books on a scale, so that the output, $y$, “weight” (in pounds) is a linear function of the input, $x$, “number of books”; and suppose the slope of the line is 0.1. Then:

(A) As each one book is added, the weight *increases* by ten pounds.
(B) As each one book is added, the weight *increases* by a tenth of a pound.
(C) As each one book is added, the weight *increases* by one pound.
(D) As more books are added, the weight *decreases*.

14. Nine sales representatives, 6 men and 3 women, at a small company wanted to attend a national convention. There were only enough travel funds to send 3 people. The manager selected 3 people to attend and stated that the people were selected at random. The 3 people selected were women. There were concerns that no men were selected to attend the convention.

a) How many total sales representatives are considered in this problem?
b) Is the company small or large?
c) What do the nine sales representatives want to attend?
d) Why can only 3 people attend?
e) How did the manager select the 3 people?
f) What is the manager concerned about?

15. *Use the graph at the right to answer* the following questions. *Include references to the figure, to justify each answer.*

a) Approximate the median salary for a person who works for corporation B.
b) Approximate the largest salary for a person who works for corporation B.
c) Approximate the interquartile range for Corporation B.

16. *Give unsimplified fractional answers.* If you were to roll a standard die one time, what is the probability that it will:

a) land on a 3?
b) not land on a 2?
c) land on an even number?

VI. *First Day of Class:* Bring your summer work, your calculator, your notebook, and a *3.1 ounce* (unopened) box of regular M&Ms.

*Some problems edited from sources developed by R. Oben, A. Schreier, M. Nied, and The College Board.*