

# **Summer Work Packet for MPH Math Classes**

**Students going into**

**AP Statistics**

**Sept. 2017**

**Name:** \_\_\_\_\_

**This packet is designed to introduce students to statistics and data analysis.**

**First and foremost, to be successful in this course, you will need to read the textbook. 99.9% of the students who do well in Statistics read the textbook (Okay, I made up that statistic but I am positive there is an association between the two variables).**

**Read the first two chapters in the textbook. (Digital copies of the first two chapters can be found online and PDF files are on the website.) Answer the questions/problems below. If you have any questions, please email Mr. Schroth at [cschroth@mphschool.org](mailto:cschroth@mphschool.org).**

Answer the questions below in complete sentences.

What is the difference between *Statistics* and a *statistic*? Give me an example of a statistic.

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What is the difference between a *population* and a *sample*?

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Use the reading/internet to define the two words below. Also provide 3 examples of each.

**Categorical Variable** - \_\_\_\_\_

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Examples: 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

**Quantitative Variable** - \_\_\_\_\_

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Examples: 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

Complete the chart below:

The Kentucky Derby is a horse race that has been run every year since 1875 at Churchill Downs, Louisville, Kentucky. The race started as a 1.5-mile race, but in 1896, was shortened to a 1.25 miles because experts felt that 3-year-old horses shouldn't run such a long race that early in the season. Below is the data for the first four and several recent races.

<b>Date</b>	<b>Winner</b>	<b>Margin (lengths)</b>	<b>Jockey</b>	<b>Payoff (\$)</b>	<b>Duration (min:sec)</b>	<b>Track Condition</b>
5/17/1875	Aristides	2	O. Lewis	2850	2:37.75	Fast
5/15/1876	Vagrant	2	B. Swim	2950	2:38.25	Fast
5/22/1877	Baden-Baden	2	W. Walker	3300	2:38.00	Fast
5/21/1878	Day Start	1	J. Carter	4050	2:37.25	Dusty
5/1/2004	Smarty Jones	2 <sup>3</sup> / <sub>4</sub>	S. Elliot	854,800	2:04.06	Sloppy
5/7/2005	Giacomo	<sup>1</sup> / <sub>2</sub>	M. Smith	5,854,800	2:02.75	Fast
5/6/2006	Barbaro	6 <sup>1</sup> / <sub>2</sub>	E. Prado	1,453,200	2:01.36	Fast
5/5/2007	Street Sense	2 <sup>1</sup> / <sub>4</sub>	C. Borel	1,450,000	2:02.17	Fast
5/3/2008	Big Brown	4 <sup>3</sup> / <sub>4</sub>	K. Desormeaux	1,451,800	2:01.82	Fast

<u>Variable</u>	<u>Type</u>	<u>Unit</u>
1. Date	Categorical or Quantitative	Mo./Day/Yr.
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____
6. _____	_____	_____
7. _____	_____	_____

Write a few sentences about the data (anything standout/unusual? Outliers?)

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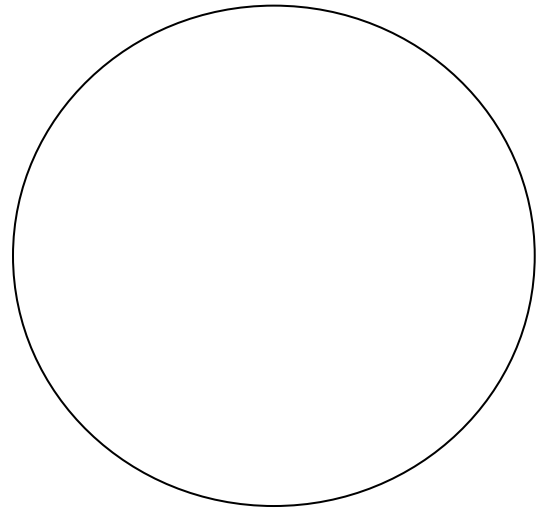
**\*\*\*You may need to look on the internet to review how to create the various visual displays below.\*\*\***

Below, create a bar graph and a pie chart of the categorical variable “Track Condition.” Label appropriately, make a key if necessary.

Track Condition



Track Condition



Below, create a histogram and stem-and- leaf display of the quantitative variable “Margin (lengths).” Label appropriately.



0  
1  
2  
3  
4  
5  
6  
7

Statistical Data for categorical data and quantitative data differ. Categorical data looks at percentages, for example, the percentage of years the track conditions were “fast.” Quantitative data or variables, on the other hand, look at the center (mean, median), shape (modes) and spread (standard deviation, range).

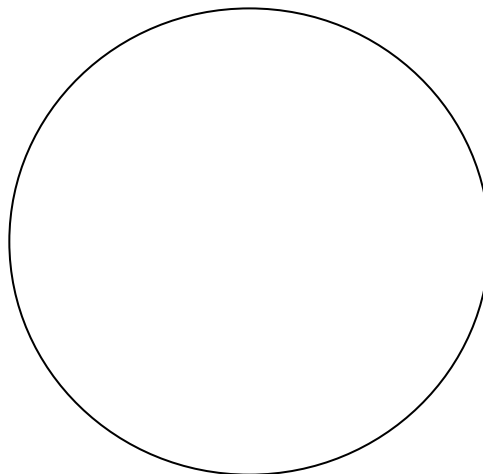
Use the following contingency table (with the two categorical variables: Eye Color and Gender) to answer the questions below.

**Eye Color**

	<b>Blue</b>	<b>Brown</b>	<b>Green/Hazel/Other</b>	<b>Total</b>
<b>Gender</b> <b>Males</b>	6	20	6	32
<b>Females</b>	4	16	12	32
<b>Total</b>	10	36	18	64

1. What percent of females are brown-eyed? \_\_\_\_\_
2. What percent of browned-eyed students are female? \_\_\_\_\_
3. What percent of students are brown-eyed females?
4. Create a pie chart below for the distribution of eye color

**Eye Color**



The following frequency table shows the quantitative variables height (in inches) of 25 members of the high school choir. Use the table to answer the questions below.

Heights	Counts
60	5
61	3
62	8
63	0
64	5
65	3
66	0
67	1

1. Find the mean, median, mode and range of the data set.

Mean - \_\_\_\_\_

Median - \_\_\_\_\_

Mode - \_\_\_\_\_

Range - \_\_\_\_\_

2. Display these data with a histogram.

