**Linear Relations Review Project**

***Kick Off BBQ Planning* Name: \_\_\_\_\_\_\_\_\_\_\_\_\_**

NAIT is hosting a Kick Off BBQ for their 28,000 students. You have been asked to assist in the planning for the BBQ and are responsible for the root beer, hamburger buns, and mini-Frosters.

As a Harry Ainlay graduate you have experienced high quality Welcome Back BBQ’s and you decide to ask the Harry Ainlay Student’s Council for some advice to help you with the NAIT Kick Off BBQ.

**Part A – Root Beer**

To figure out how many bottles of root beer to order you ask the Ainlay Student’s Council for their records over the past five years. The information they provide you is found below in the table:

|  |  |
| --- | --- |
| **# of Students** | **# of root beer bottles used.** |
| 2170 | 276 |
| 2050 | 245 |
| 2370 | 300 |
| 2240 | 280 |
| 2090 | 260 |

To get an accurate estimate of how many bottles you need to order for the NAIT Kick Off BBQ you decide to make a scatterplot of root beer bottles used vs. # of students and use a line of best fit to extrapolate.

Use Microsoft Excel to create a scatterplot and a line of best fit. Determine the equation of the line of best fit and use it to extrapolate. How many bottles should you order for NAIT if all 28,000 students attend the BBQ? Include a print-out or sketch of your scatterplot.

**Part B – Hamburger Buns**

You’ve contacted a grocery store and received a bulk discount price of $2 for a dozen buns.

1. If each student has one hamburger:
   * what is the cost for buns if 15 000 students attend the BBQ?
   * what is the maximum cost for buns?
2. Is the relationship between the cost of the buns and the number of students a direct variation or a partial variation? Explain how you know.
3. Write an equation that represents the total cost of buns, *C*, vs. the number of students at the BBQ, *n*.

**Part C – Mini-Frosters**

The Mini-Froster machine that Ainlay rents costs $50 to rent plus a charge of $0.25 per froster.

1. Write an equation that represents the total cost of renting the Mini-Froster, *C*, vs. the number of Mini-Frosters made, *n*.
2. From your contacts at Ainlay you determine that the minimum number of students at the BBQ is usually around 75% of the total student population. Use the equation to calculate the minimum and maximum possible cost. Show your calculations.
3. Create a graph showing the total cost of renting the Mini-Froster machine based on the number of students that have a Mini-Froster. Your graph should show the costs from the minimum number of students expected to the maximum number possible.
4. Is the relationship between the total cost of renting the Mini-Froster vs. the number of students that have a Mini-Froster a direct variation or a partial variation? Explain how you know.