Project 2.1 Sean Parrell STA 3032

**Problem 1: Lottery Tickets**

**Problem:** Three lottery tickets for first, second, and third prizes are drawn from a group of 40 tickets. Find the number of sample points in SSS for awarding the 3 prizes if each contestant holds only 1 ticket.

**Solution**

This problem involves selecting 3 distinct tickets from 40, where the order matters since each prize is distinct. This is a permutation problem because the order in which the prizes are awarded matters.

The formula for permutations is:

Where n=40 and r=3.

Thus:

Therefore, the number of sample points in S according to the math that me, Sean Parrell, generated is **59,280**.

**Problem 2: Probability Problem from Screenshots**

**Problem:** In the senior year of a high school graduating class of 100 students, several students are enrolled in different combinations of mathematics, psychology, and history. Based on the information given, we are to calculate the following probabilities:

**Solution (a)**

**Event:** A person enrolled in psychology takes all three subjects.

We are asked to find the conditional probability of a person taking all three subjects given that they are enrolled in psychology.

Using the conditional probability formula:

Where:

* A is the event that the person takes all three subjects.
* B is the event that the person is enrolled in psychology.

From the information given:

* P(A∩B) is the probability that a person takes all three subjects, which is 10 students.
* P(B) is the probability that a person takes psychology, which is 68 students.

Therefore:

Thus, the probability according to my math that me, Sean Parrell, generated is

**Solution (b)**

**Event:** A person not taking psychology is taking both history and mathematics.

We are asked to find the probability that a person who is not enrolled in psychology is taking both history and mathematics.

Using the given information:

* 42 students are enrolled in mathematics, 54 in history, and 25 in both mathematics and psychology.
* 22 students take both mathematics and history, 10 of which are enrolled in all three subjects.

Thus, the number of students who take both mathematics and history but not psychology is:

Additionally, the number of students who are not taking psychology is:

Therefore, the probability is:

Thus, the probability that me, Sean Parrell, thinks correct is