**Conditional Probability Using Classroom Data**

*Procedures*

1. Define Characteristic A and Characteristic B.

Characteristic A is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Characteristic B is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Complete the frequency table for each person in the classroom using a 1 for “yes, the student has the selected characteristic” and a 0 for “no, the student does not have the selected characteristics”.

*Frequency Table*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Student ID** | **Characteristic A** | **Characteristic B** | **Student ID** | **Characteristic A** | **Characteristic B** |
| 1 |  |  | 17 |  |  |
| 2 |  |  | 18 |  |  |
| 3 |  |  | 19 |  |  |
| 4 |  |  | 20 |  |  |
| 5 |  |  | 21 |  |  |
| 6 |  |  | 22 |  |  |
| 7 |  |  | 23 |  |  |
| 8 |  |  | 24 |  |  |
| 9 |  |  | 25 |  |  |
| 10 |  |  | 26 |  |  |
| 11 |  |  | 27 |  |  |
| 12 |  |  | 28 |  |  |
| 13 |  |  | 29 |  |  |
| 14 |  |  | 30 |  |  |
| 15 |  |  | 31 |  |  |
| 16 |  |  | 32 |  |  |

*Questions*

1. Determine the following probabilities.

P(A) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P(B) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P(A│B) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P(B│A) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P(A and B) or $P(A∩$ B) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

P(A or B) or $P(A∪$ B) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Based on the data from the frequency table, create a Venn diagram using Student IDs.
2. Given the above Venn diagram, determine whether Events A and B are independent. Justify your conclusion. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Given the above Venn diagram, determine what characteristic(s) are the compliments of Events A and B. Justify your answer. \_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_