**Review Ch. 5 – Do the 3 problems here AND p. 336 #1-3, 5-10, 13a**

1. How common is it for young adults to have their ears pierced? The two-way table below displays the data for students in a college statistics class.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Pierced Ears?** | | |
|  | **Yes** | **No** | **Total** |
| Male | 19 | 71 | **90** |
| Female | 84 | 4 | **88** |
| **Total** | **103** | **75** | **178** |

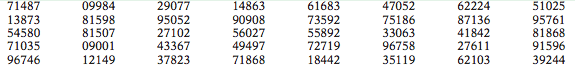
Suppose we choose a student from the class at random.

1. Find the probability that the student has pierced ears.
2. Find the probability that the student is a male with pierced ears.
3. Find the probability that the student is male or has pierced ears.
4. Construct a Venn diagram that displays the information in the two-way table.
5. If we know that the randomly chosen student has pierced ears, what is the probability that the student is male?
6. If we know that the randomly chosen student is male, what is the probability that they have pierced ears?
7. Are the events “male” and “pierced ears” independent? Show work.
8. You work at Mike’s pizza shop. You have the following information about the 7 pizzas in the oven: 3 of the 7 have thick crust, and of these 1 has only sausage and 2 have only mushrooms. The remaining 4 pizzas have regular crust, and of these 2 have only sausage and 2 have only mushrooms. Choose a pizza at random from the oven.
   1. Are the events “getting a thick-crust pizza” and “getting a pizza with mushrooms” independent?
   2. You add an eighth pizza to the oven. This pizza has thick crust with only cheese. Now are the events “getting a thick-crust pizza” and “getting a pizza with mushrooms” independent?

\*\* Is there a connection between mutually exclusive and independent?

Let’s say we choose a U.S. adult at random. Define event A: the person is male, and event B: the person is pregnant. It’s pretty clear that these two events are mutually exclusive (can’t happen together)! What about independence? If you know that event A has occurred, does this affect the probability that event B happens? Of course! If we know the person is male, then the chance that the person is pregnant is 0. Since P(B|A) ≠ P(B), the two events are not independent. **Two mutually exclusive events can never be independent**, because if one event happens, the other event is guaranteed not to happen.

1. Mudlark Airlines has a 15-seater commuter turboprop that is used for short flights. Their data suggest that about 8% of the customers who buy tickets are no-shows. Wanting to avoid empty seats and avoid missing an opportunity to increase revenue, they decide to sell 17 tickets for each flight. Ticketed customers who can’t be seated on the plane will be accommodated on another flight and will receive a certificate good for a free flight at another time. Describe the design of a simulation to estimate the probability that at least one ticket-holder is denied a seat on the plane if 17 tickets are sold. Explain clearly how you will use the random digits below. Perform 5 repetitions of the simulation. Mark directly on the table to show your results.



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