**AP Statistics Guided Notes: Chapter 5.2 (PART 2)**

Terminology

* Two-way table (draw the example table on p. 303)

Find the probability that a randomly chosen student…

a) …has pierced ears

P(pierced ears)=

b) …is a male with pierced ears

P(male and pierced ears)=

c) …is male or has pierced ears

P(male or pierced ears)=

|  |
| --- |
| **Pierced Ears?** |
| **Gender** | **Yes** | **No** | **Total** |
| Male |  |  |  |
| Female |  |  |  |
| **Total** |  |  |  |

* Venn diagram (draw the diagram on p. 304 including the arrows for what each part represents)

Notation & Probability Rules

* $P\left(A and B\right)=P\left(A∩B\right)=P\left(the intersection of A and B\right)=The probability of events A and B ocurring at the same time$
* $P\left(A or B\right)=P\left(A∪B\right)=P\left(the union of A and B\right)=The probability of event A happening or event B happening \left(or both\right).$

**Basic Probability Rules**

* **Addition rule for mutually exclusive events:** If A and B are mutually exclusive, $P\left(A or B\right)=P\left(A\right)+P(B)$
* **General Addition Rule:** If A and B are any two events resulting from a chance process, then

$$P\left(A or B\right)=P\left(A\right)+P\left(B\right)-P(A and B)$$

You try!

1. What is the relationship between educational achievement and home ownership? A random sample of 500 people who participated in the 2000 census was chosen. Each member of the sample was identified as a high school graduate (or not) and as a home owner (or not). The two-way table displays the data. *Define event A as graduating from high school and event B as owning a home.*

|  |
| --- |
| **High School Graduate?** |
| **Homeownership Status** | **HS Grad** | **Not a HS Grad** | **Total** |
| Homeowner | 221 | 119 | 340 |
| Not a homeowner | 89 | 71 | 160 |
| **Total** | **310** | **190** | **500** |

Suppose we choose a member of the sample at random. Find the probability that each member…

a) …is a high school graduate. $P\left(A\right)=$

b) …is a high school graduate and owns a home. $P\left(A∩B\right)=$

c) …is a high school graduate or owns a home. $P\left(A∪B\right)=$

2. Create a Venn diagram for the homeownership data above. Clearly label your diagram.

3. Represent the areas of the Venn diagram using words, symbols & counts. Refer to the example on p. 306 if you need help.

|  |
| --- |
| **High School Graduate?** |
| **Region in the Venn diagram** | **In words** | **In symbols** | **Count** |
| In the intersection of two circles |  |  |  |
| Inside circle A, outside circle B |  |  |  |
| Inside circle B, outside circle A |  |  |  |
| Outside both circles |  |  |  |