**AP Statistics Guided Notes: Chapter 5.3 (PART 1)**

Terminology

* Conditional probability –
* Independent events –
* Tree diagram –

P(two heads) =

P(one head, one tail) =

P(one tail, one head) =

P(two tails) =

Notation & Probability Rules

* **Conditional Probability:**

**Probability Rules**

* **Independent Events:** events A and B are independent if and
* **General Multiplication Rule:** The probability that events A and B both occur can be found using the general multiplication rule: where P(B|A) is the conditional probability that event B occurs given that event A has already occurred.

*In other words, this rule says that for both of two events to occur, first one must occur, and then given that the first event has occurred, the second must occur.*

You try!

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** |

1. a) If we know that a person owns a home, what is the probability that the person is a high school graduate?

b) If we know that a person is a high school graduate, what is the probability that the person owns a home?

2. Are the events independent? Back up your answer with probability calculations.

3. Suppose we choose one person at random. Draw a tree diagram that shows the sample space for this chance process.

4. Use the general multiplication rule to find the probability that someone is a high school grad and owns a home,