**Unit 8 #4 Conditional Probability**

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| **CONDITIONAL PROBABILITY** | **FORMULA** |
| * Conditional Probability contains a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that may \_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ space for an event.
* You can write a conditional probability using the notation:

P = $\frac{ }{ }$This reads “the probability of event B, given event A” | The probability that \_\_\_\_\_\_\_\_\_\_ will occur given that another \_\_\_\_\_\_\_\_\_\_ has already occurred.FORMULA: P(\_\_\_|\_\_\_) = $\frac{ }{ }$ |

Example 1: The table shows the results of a class survey. Find *P*(own a pet|female).

**Example 2: *Education -*** The table shows students by gender at two-and four-year colleges, and graduate schools in 2005. You pick a student at random.

* What is P(female|grad school)?
* What is P(four year|male)?

Example 3: *Statistics -* Americans recycle increasing amounts through municipal waste collection. The table shows the collection data for 2007.

* What is the probability that a sample of recycled waste is paper?
* What is the probability that a sample of non-recycled waste is plastic?

Practice Problem #1: *Market Research.* A utility company asked 50 of its customers whether they pay their bills online or by mail. What is the probability that a customer pays the bill online, given the customer is male?



Practice Problem #2: *Market Research.* Researchers asked shampoo users whether they apply shampoo directly to the head, or indirectly using a hand. What is the probability that a respondent applies shampoo directly to the head, given the respondent is female?

Challenge Problems:

1. Find the probability that a respondent has a pet, given that the respondent has had a pet.
2. Find the probability that a respondent has never had a pet, given that the respondent does not have a pet now.