Daily Agenda

Learning Targets: I can define conditional probability.
I can find conditional probability using contingency tables.

Homework	Assessments
10.3 Day 1 WS	10.1-10.2 Quiz 4/28
	Unit 10 A Test - 5/5

Do not let what you cannot do interfere with what you can do.
-John Wooden

Nov 15-8:24 PM

10.3 Conditional Probability

Conditional Probability
The probability that an event B will occur given that another event A has already occurred. Exists when the events are dependent.

P(B|A) means "the probability of event B, given eve

Contingency Table
A two way frequency table. Contains data from two different categories. Can help find conditional proba

Feb 9-11:33 AM

10.3 Conditional Probability

Conditional Probability
$$P(B \mid A) = \frac{P(A \text{ and } B)}{P(A)}$$

Feb 9-11:33 AM

Example
A card is drawn from a standard deck of cards. Find each probability, **given that** the card drawn is black.

1. P(club)　　　　**2.** P(4)　　　　**3.** P(diamond)

$P(\text{club} \mid \text{black})$　$P(4 \mid \text{black})$　　0

$\frac{13}{26} = \frac{1}{2}$　　$\frac{2}{26} = \frac{1}{13}$

Mar 30-11:34 AM

Example: The table shows students by gender and type of school in 2005. You pick a student at random.

Student Genders

	Males (in thousands)	Females (in thousands)
Two-year colleges	1866	2462
Four-year colleges	4324	5517
Graduate schools	1349	1954

Source: U.S. Census Bureau

1. What is P(female)? $\frac{9933}{17472} = 57\%$

2. What is P(female | graduate school)? $\frac{1954}{3303} = 59\%$

3. What is P(four-year | male)? $\frac{4324}{7539} = 57\%$

7539　　$\frac{9933}{17472}$

Mar 30-11:00 AM

Example: 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 that the customer is male?

Bill Payment

	Online	By Mail
Male	12	8
Female	24	6

1. What is P(online | male)? $\frac{12}{20} = 60\%$

2. What is P(mail and female)? $\frac{6}{50} = 12\%$

3. What is the probability that the customer pays the bill online?

Mar 30-11:12 AM

Example: Researchers asked shampoo users whether they apply shampoo directly to their head, or indirectly using their hand. What is the probability that a respondent applies shampoo directly to their head, given that the respondent is female?

1. What is P(directly | female)?

$$\frac{6}{30} = 20\%$$

2. What is P(directly and female)?

$$\frac{6}{50} = 12\%$$

Applying Shampoo

	Directly Onto Head	Into Hand First
Male	2	18
Female	6	24

Mar 30-11:16 AM

Example: Use the survey results to answer the following questions.

1. Find the probability that a respondent has a pet, given that the respondent has had a pet.

39% have a pet now and have had a pet.
61% do not have a pet now.
86% have had a pet.
14% do not have a pet now and have never 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.

Mar 24-11:27 PM

Example: Use the table to find each probability.

1. P(has diploma)

2. P(has diploma and experience)

3. P(has experience | has diploma)

4. P(has no diploma | has experience)

Characteristics of Job Applicants

		Has Experience	
		Yes	No
Has High School Diploma	Yes	54	27
	No	5	4

Mar 30-1:57 PM

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