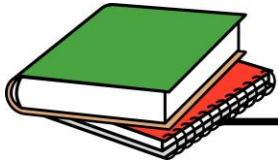Name: _____ Hour: _____ Date: _____

Lesson 11.2: Day 2: Are gender and favorite class independent?

English **VS** MATH

Is there an association between gender and preference of English or math class? Below is the data for a random sample of senior students. Do we have convincing evidence that gender and favorite class are associated?

1. Describe what it means for two events to be independent. (Chapter 5)

2. Calculate the expected counts.

Observed:

	English	Math	Total
Female	43	22	65
Male	21	28	49
Total	64	50	114

Expected:

	English	Math	Total
Female			
Male			
Total			

3. Do the data provide significant evidence that there is an association between gender and preference of English or math class? Use $a = 0.05$

STATE: Hypotheses: Significance level:

PLAN: Name of procedure: **chi-square test for independence**

Check conditions:

DO: Specific Formula:

Work: Picture:

Test statistic:

P-value:

CONCLUDE:

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Lesson 11.2: Day 2: Chi-Square Test for Independence

Important ideas:

Check Your Understanding

For each of the following situations decide what type of chi square test is appropriate. Explain.

1. Shopping at secondhand stores is becoming more popular and has even attracted the attention of business schools. A study of customers' attitudes toward secondhand stores interviewed separate random samples of shoppers at two secondhand stores of the same chain in different cities. The two-way table shows the breakdown of respondents by gender.

		Store		
		A	B	Total
Gender	Male	38	68	106
	Female	203	150	353
	Total	241	218	459

2. The General Social Survey (GSS) asked a random sample of adults their opinion about whether astrology is very scientific, sort of scientific, or not at all scientific. Here is a two-way table of counts for people in the sample who had three levels of higher education:

		Degree held			
		Associate's	Bachelor's	Master's	Total
Opinion about astrology	Not at all scientific	169	256	114	539
	Very or sort of scientific	65	65	18	148
	Total	234	321	132	687

3. Casinos are required to verify that their games operate as advertised. American roulette wheels have 38 slots—18 red, 18 black, and 2 green. In one casino, managers record data from a random sample of 200 spins of one of their American roulette wheels. The table displays the results.

Color	Red	Black	Green
Count	85	99	16

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