CATEGORICAL VARIABLES



A class was asked whether homework should count toward the course grade. The answers were simplified into two categories: Yes and No. The teacher's wife conjectured that the female students are more likely to answer Yes. To test this, the students were classified as male or female.

	Male	Female	Row Totals
Yes	4	6	10
No	3	2	5
Column Totals	7	8	15

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MARGINAL DISTRIBUTIONS:								
1.	The marginal distribution of sex:							
	Male	Female						
2.	The marginal distribution	of responses:						
	Yes	No						
CONDITIONAL DISTRIBUTIONS:								
1.	Conditional distribution for response if the student was male:							
•	Yes	No						
2.	Conditional distribution for response if the student was female:							
	Yes	No						
3.	Conditional distribution of sex if the response was "no":							
	Male	Female						
4.	Conditional distribution of sex if the response was "yes":							
	Male	Female						
	CONCLUSION							

2003 AP® STATISTICS FREE-RESPONSE QUESTIONS (Form B)

2. A simple random sample of adults living in a suburb of a large city was selected. The age and annual income of each adult in the sample were recorded. The resulting data are summarized in the table below.

Age Category	\$25,000-\$35,000	\$35,001-\$50,000	Over \$50,000	Total
21-30	8	15	27	50
31-45	22	32	35	89
46-60	12	14	27	53
Over 60	5	3	7	15
Total	47	64	96	207

- (a) What is the probability that a person chosen at random from those in this sample will be in the 31-45 age category?
- (b) What is the probability that a person chosen at random from those in this sample whose incomes are over \$50,000 will be in the 31-45 age category? Show your work.
- (c) Based on your answers to parts (a) and (b), is annual income independent of age category for those in this sample? Explain.