Contingency Tables & Probabilities Solutions

A volunteer for the Drug & Alcohol Education Center was investigating the attitudes of CSU students towards binge drinking on campus. A simple random sample of 730 students from all four grade levels was taken. Each student was given the statement "Binge drinking of CSU students has become too frequent and dangerous," and asked whether they strongly agreed, agreed, had no opinion, disagreed, or strongly disagreed. The following contingency table summarizes the results.

1) Complete the contingency table.

Grade	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	Totals
Freshman		37	11	92	49	
Sophomore	35	28		59	28	**175**
Junior	36	32	39	43		**190**
Senior	48	38	22		14	**153**
Totals	**142**		**97**	**225**	**131**	**730**

2) What is the marginal probability of those students who have no opinion?

97/730 = 0.133

3) What is the interpretation of this marginal probability?

Approximately 13.3 % of the students had no opinion of the statement.

4) Compute the conditional probability that a student disagreed with the statement given they were a junior.

Pr {Disagree | Junior} =

43/190 = 0.226

5) What is the interpretation of this conditional probability?

Among all CSU juniors, an estimated 22.6% did not agree that binge drinking at CSU had become too frequent and dangerous.

6) What is the conditional probability that a student was a sophomore given they strongly agreed?

Pr {Sophomore | Strongly Agree} =

35/142 = 0.246

7) Interpret this conditional probability in terms of the problem.

Approximately 24.6% students were sophomores given that they strongly agreed.

8) Say another volunteer was going to take a simple random sample of 350 seniors at CSU and ask their opinion of the same statement above. How many seniors that agree with the statement would they expect to find?

Pr {Agree | Senior} = 38/153 = 0.248

350 (0.248) = 86.8 ≈ 87 seniors would agree with the statement