SOLUTIONS TO

TEST YOUR KNOWLEDGE: Probability

The following contingency table shows the result of a crosstabulation of type of student (A = American Student and I = International Student) by major (S = Science and S' = non-Science major). The purpose of the study is to see whether foreign students are more likely to major in the sciences than U.S. students.

	American Student (A)	International Student (I)	
Science Major (S)	550	450	**1000**
Non-Science Major (S')	4,450	550	**5000**
	5000	**1000**	**6000**

1. P(A and S) = 550 / 6000 = .092

2. P(S|A) = 550 / 5000 = .11

3. P(S or A) = 5450 / 6000 = .91
ALSO: P(S or A) = P(S) + P(A) – P(S and A) = .167 + .833 - .092 = .908

4. P(S) = 1000 / 6000 = .167

5. P(A|S) = .092 / .167 = .55
ALSO: = 550 / 1000 = .55

6. P(S' | I) = 550 / 1000 = .55

6. Are type of student and major independent? Explain.

ANS.: No!

P(S) = .167
P(S|A) = .11
P(S|I) = .45

ALT.: P(S and A) $\neq$ P(S)P(A)
.092 $\neq$ (.167)(.833)