Name _____   Date _____
Mr. Schlansky   Algebra II

Determining Independence

1. The results of a poll of 200 students are shown in the table below:

	Preferred Music Style		
	Techno	**Rap**	**Country**
Female	54	25	27
Male	36	40	18

For this group of students, do these data suggest that gender and preferred music styles are independent of each other? Justify your answer.

2. At a local mall, 125 people were asked how they choose to pay for their merchandise. The data is shown in the table below:

	Credit Card	Cash
Male	40	10
Female	60	15

Does the data suggest that the gender and type of payment are independent of each other? Explain your answer.

3. One-hundred employees of a company were asked their opinion on paying high salaries to the CEO. Their responses are summarized in the following contingency table.

	In Favor	Against
Male	15	45
Female	4	36

Based on the data, are gender an opinion on salaries independent of each other? Justify your answer.

4. A study was being done to determine the link between students having asthma and household members smoking. The probability that a randomly selected student at this high school has asthma is 0.193. The probability that a randomly selected student has at least 1 household member who smokes is 0.421.

In addition to the previously given probabilities, the probability that a randomly selected student has at least one household member who smokes and has asthma is 0.120.

Are the events a student has asthma and a student having a household member who smokes independent of each other? Justify your answer.

5. In contract negotiations between a local government agency and its workers, it is estimated that there is a 50% chance that an agreement will be reached on the salaries of the workers. It is estimated that there is a 70% chance that there will be an agreement on the insurance benefits. There is a 20% chance that no agreement will be reached on either issue. Find the probability that an agreement will be reached on *both* issues. Based on this answer, determine whether the agreement on salaries and the agreement on insurance are independent events. Justify your answer.

6. Given events A and B, such that $P(A) = 0.6$, $P(B) = 0.5$, and $P(A \cup B) = 0.8$, determine whether A and B are independent or dependent.

7. The results of a survey of the student body at Central High School about television viewing preferences are shown below.

	Comedy Series	Drama Series	Reality Series	Total
Males	95	65	70	230
Females	80	70	110	260
Total	175	135	180	490

Are the events "student is a male" and "student prefers reality series" independent of each other? Justify your answer.

8. A study was done at West Apple High School analyzing the student lateness and Regents Exam results. It was found that 32% of the students arrive to school late and 72% pass their Regents Exams. 14% of the students who do not arrive late do not pass their Regents Exams. Are the events "student is late" and "student passes Regents Exams" independent of each other? Justify your answer.

9. Given events A and B, such that $P(A) = 0.8$, $P(B) = 0.6$, and $P(A/B) = 0.6$. Determine whether A and B are independent. Explain your answer.

10. Out of the 28 days in February, Jackie made coffee 24 days. Out of the 14 days it rained, Jackie made coffee 12 times. Are the events "Jackie makes coffee" and "it rains" independent of each other? Explain your answer.

11. Sean's team has a baseball game tomorrow. He pitches 50% of the games. There is a 40% chance of rain during the game tomorrow. If the probability that it rains given that Sean pitches is 40%, it can be concluded that these two events are
1) independent
2) dependent
3) mutually exclusive
4) complements