Name:

Elementary Statistics

- 1. Let *R* be the event of randomly selecting a senator and getting a Republican and let *D* represent the event of randomly selecting a second *different* senator and getting a Democrat.
 - a. Use words to describe what the notation P(D|R) represents.
 - b. Are the events *R* and *D* independent or dependent? Explain.
- 2. True or False: The event of finding that your car's radio works and the event of finding that your car's air conditioner works are independent events because they work separately from each other. Explain why you chose true or false.

Questions 3-6: For part *a*, determine whether the events A and B are independent or dependent. For part *b*, find *P*(*A* and *B*) which is the probability that the events A and B both occur.

- 3. A: When a baby is born, it is a girl.
 - B: When a second baby is born into a different family, it is also a girl.
 - a. Independent or dependent?
 - b. P(A and B)
- 4. A: When a day of the week is randomly selected, it is a Saturday.B: When a second different day of the week is randomly selected, it is a Monday.
 - a. Independent or dependent?
 - b. P(A and B)

5. A: When the first digit (0 through 9) of a four-digit lottery number is chosen by someone buying a ticket, it is the same first digit that is later drawn in the official lottery.

B: When the second digit of a four-digit lottery number is chosen by someone buying a ticket, it is the same digit that is later drawn in the official lottery.

- a. Independent or dependent?
- b. P(A and B)
- 6. A: When an M&M is randomly selected from 100 M&M's listed in a sample, it is one of the 8 yellow M&M's.

B: When a second different M&M is randomly selected from the same sample, it is also a yellow M&M.

- a. Independent or dependent?
- b. P(A and B)

	Positive Test Result	Negative Test Result
Subject Uses Drugs	44	6
	(true positive)	(false negative)
Subject Does Not Use Drugs	90	850
	(false positive)	(true negative)

- 7. Use the table above: If 2 of the 1000 test subjects are randomly selected, find the probability that they both had false positive results. Is it unlikely to randomly select 2 subjects and get 2 results that are both false positive results?
 - a. Assume that the 2 selections are made with replacement.
 - b. Assume that the 2 selections are made without replacement.

- 8. Use the table above: If 4 of the 1000 test subjects are randomly selected, find the probability that they all had true negative results. Is such an event unlikely?
 - a. Assume that the 4 selections are made with replacement.
 - b. Assume that the 4 selections are made without replacement.
- 9. Assume that Google, Inc. hires employees on the different days of the week (Monday through Friday) with equal likelihood.
 - a. If two different employees are randomly selected, what is the probability that they are both hired on a Monday?
 - b. If two different employees are randomly selected, what is the probability that they were both hired on the same day of the week?
- 10. Among respondents asked which is their favorite seat on an airplane: 492 chose the window seat, 8 chose the middle seat and 306 chose the aisle seat.
 - a. What is the probability of randomly selecting 1 of the surveyed people and getting one who did not choose the middle seat?
 - b. If 2 of the surveyed people are randomly selected without replacement, what is the probability that neither of them chose the middle seat?