

Name: _____

Sample Examination #3, Stat 1001, S. Weisberg

1. Problem 7, page 238.
2. Problem 4, page 251.
3. Problem 9, page 252.
4. Define two events: $A = \{\text{the Dow-Jones Industrial average increases by at least 10 points tomorrow}\}$, and $B = \{\text{the NASDAQ decreases by at least 10 points tomorrow}\}$.
Suppose that the probability that A occurs, $P(A) = 0.4$; $P(B) = 0.3$ and also that $P(A \text{ and } B \text{ both occur}) = 0.25$. Are the two events A and B independent or dependent? How do you know?
5. A box contains 10 tickets, Four tickets are marked "Winner" and six tickets are marked "Try again". You draw from the box twice, with replacement each time.
 - (a) are the two events $A = \{\text{Draw a Winner on the first draw}\}$ and $B = \{\text{Draw a winner on the second draw}\}$ independent, mutually exclusive, or neither?
 - (b) If you draw at least one "Winner", you get a prize, otherwise you get nothing. What is the probability that you win a prize?
6. Two species of bacteria can appear together or separately. By examining many samples, we find that species A is present 40% of the time and species B is present 20% of the time. Both A and B are present 12% of the time.
 - (a) What is the basis for the probability that A is present?
 - (b) What is the probability that A is NOT present in a particular sample?
 - (c) Are the events $\{\text{Species } A \text{ present}\}$ and $\{\text{Species } B \text{ present}\}$ independent? How do you know?
 - (d) If you examine 4 samples (selected at random), what is the probability that A is not present in any of the samples?
 - (e) What the the probability that the first sample that includes A is either the first sample taken or the second sample taken or the third sample taken?
7. You are required to assess whether the risk of being in an airplane accident is greater on a domestic airline flight between two US destinations or on a foreign flight (between two non-US destinations). Explain how forgotten base rates and the availability heuristic might lead you to assess these risks incorrectly.
8. Problem 7, page 310.
9. Problem 25, page 276.