

STAT 215C – Homework 3

Due February 12 by 3pm

Instructions:

Please include the following information on the first page of your completed homework.

- Name
- STAT 215
- Homework 3
- Due date
- List of students you worked with (if applicable)

Please remember to show your work and explain answers as necessary. Answers that are not supported by good reasoning will not receive full credit. Homework should be stapled if it is longer than one page.

Section 2.3: 30, 38(a-c)

Boxcar Defects. A boxcar contains 7 complex electronic systems. Two of the seven are to be randomly selected for thorough testing and then classified as either defective or not defective. If two of the of seven systems are actually defective find the following probabilities:

- a. Both systems selected are defective.
- b. At least one of the systems selected is defective.

Poker Chips. There are 3 white poker chips, 5 blue poker chips, and 1 red poker chip in a bag. You randomly select 3 poker chips from the bag.

- a. Calculate the probability that there is one of each chip color.
- b. Calculate the probability that there are no blue chips.
- c. Calculate the probability that there is at least one blue chip.

Section 2.4: 45, 47, 60

Olympic Drug Testing. Suppose there is a diagnostic blood test to detect use of a performance enhancing drug which will be administered to all Olympic athletes in Sochi prior to their competition. While the test is not perfect, the following is known:

- Among drug users, 98% had a positive test (true positive).
 - Among individuals not using the drug, 3% had a positive test (false positive).
 - Assume that 1% of athletes actually use the drug (prevalence of drug use).
- a. What is the probability of a randomly chosen athlete getting a positive test result?
 - b. Given that an athlete tests positive, what is the probability that they are actually using the drug?