

Fall 2018 COT 3100 Section 1 Quiz #4 Chapter 7: Probability (11/13, 11/15)

Name: _____

Lab Section: 18(R9) 19(R10) 20(R11) 21(T2) 22(T3) 23(T4) 24(T5)

1) (5 pts) Imagine rolling two dice, one that is a standard fair six-sided die (labeled 1 to 6), and the other which has eight sides (labeled 1 to 8, each of which are equally likely to appear when rolled). What is the probability when you roll the two dice that the sum equals 8? **Please work out your answer to a fraction in lowest terms.**

2) (8 pts) The probability that the temperature on a random day is above 90° F is 20%. (Obviously, this problem is not set in Orlando!) Given that the temperature is above 90° F, you sweat 60% of the time. If the temperature is NOT above 90° F, you sweat 30% of the time. A random day is chosen when you were sweating. What is the probability that the temperature was over 90° F that day? **Please work out your answer to a fraction in lowest terms.**

3) (10 pts) Consider a continuous random variable defined as follows:

$$f(x) = x^3, 0 \leq x \leq t \\ = 0, \textit{otherwise}$$

- (a) Using the fact that the sum of all probabilities of an event equals 1, determine the value of t .
(b) Determine the expectation of this continuous random variable. **Please give exact answers for both parts.**

4) (5 pts) A committee of five senators is chosen out of the 100 senators in the US Senate, 23 of whom are women. What is the probability that the committee will have exactly 2 women? **Please leave your answer in combinations, factorials, etc.**