

Your name: \_\_\_\_\_

**Quiz rules:**

- This quiz is closed book, but you are allowed a single page (both sides) of notes and a calculator.
- There are 6 questions, worth 6 points each.
- A normal table is provided on the last page.
- You have 50 minutes to complete this quiz.
- If you fail to show work and/or explain how you arrived at your answer then no points will be awarded.
- You do not need to solve all the problems to do well! So relax and try your best.
- **Please write expressions for probabilities instead of numerical answers, unless otherwise specified.**

1. To play the Pick-3 lotto, you choose three digits between 0 and 9. Each day, three random draws are made (with replacement) from a jar containing balls marked 0 – 9, and you win if the three digits drawn match yours (in any order).

(a) Suppose you bet on the digits 0-3-3. Show that your chance of winning is 0.6%.

(b) Suppose you bet on 0-3-3 every day. How many days would you have to play in order to guarantee a more than 50% chance of winning at least once?

2. 10% of Stats 60 students do all the reading in the textbook. Among students who do all the reading, 90% earn an A in the class. Among those who do not, only 30% earn an A. What percentage of students who earned an A would you expect to have done all the reading?

3. Twenty mice (10 male and 10 female) live in a house. The resident cat, Tom, is bored and decides to capture 7 of the mice. You may assume that Tom is equally likely to encounter any of the remaining mice at any point.

(a) What is the chance that the first 3 mice he captures are female and the last 4 are male?

(b) What is the chance the first 2 and last 2 mice he captures are male, with 3 female mice in between?

(c) What is the chance he captures 4 male and 3 female mice in total?