

Math 141  
Exam 3  
Spring 2009  
Scarborough  
FORM B

NEATLY PRINT NAME: \_\_\_\_\_

STUDENT ID: \_\_\_\_\_

DATE: \_\_\_\_\_

SECTION: 522 (9:10am) 523 (10:20am) 514 (11:30am) 814 (11:30am)

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

\_\_\_\_\_  
Signature of student

Academic Integrity Task Force, 2004

<http://www.tamu.edu/aggiehonor/FinalTaskForceReport.pdf>

My signature in this blank allows my instructor to pass back my graded exam in class or allows me to pick up my graded exam in class on the day the exams are returned. If I do not sign the blank or if I am absent from class on the day the exams are returned, I know I must show my Texas A&M student ID during my instructor's office hours to pick up my exam.

Signature of student \_\_\_\_\_

**Multiple-Choice:** On your Scantron Form No. O-101607-TAMU write and bubble in your LAST NAME, FIRST NAME, MI (MIDDLE INITIAL), DEPT (MATH), COURSE (141), SECTION, TAMU UNIVERSAL ID NUMBER (UIN), and TEST FORM B. On the Scantron also write in your instructor's name, sign your name, write today's date and write Exam III in the appropriate blank. Bubble in your answers to the multiple-choice questions # 1 – 10 on your Scantron. The Scantron will not be returned so also mark all your answers on this test paper. There is no partial credit on the multiple-choice questions. *Three points will be added to your exam grade for having the correct and non-mutilated Scantron that is completely and correctly filled out.*

**Work Out:** Write all solutions in the space provided as full credit will not be given without complete, correct accompanying work, even if the final answer is correct. Fully simplify all your answers, and give exact answers unless otherwise stated. Justify your answers algebraically whenever possible; state any special features or programs you use on your calculator. Remember your units! Make sure that you indicate your answer clearly by circling your response.

Clear your calculator before and after your exam. **MEM (2<sup>nd</sup> +), Reset, ALL, Reset**  
To turn on the correlation coefficient: **Catalog (2<sup>nd</sup> 0), DiagnosticOn, Enter, Enter**

1. (5 pts) Twenty-two (22) percent of adults in College Station can wink with both eyes. What is the probability, to 4 decimal places, that out of 300 unrelated adults in College Station, less than 59 can wink with both eyes?

- a. 0.1831
- b. 0.0307
- c. 0.1479
- d. 0.1476
- e. None of these

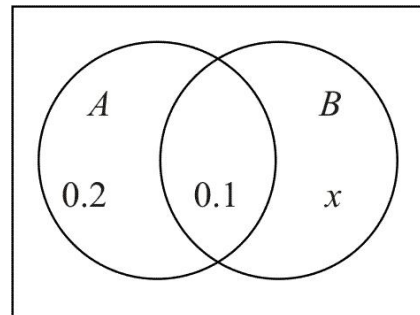
2. (5 pts) A picnic basket contains 4 forks, 4 spoons, and 2 knives. A utensil is selected at random and replaced in the basket until a fork is selected. Let  $X$  be the number of selections. What type of random variable is  $X$ ?

- a. Finite discrete
- b. Infinite discrete
- c. Continuous
- d. Not enough information
- e. None of these

3. (5 pts)

For what value of  $x$  will  $A$  and  $B$  be independent?

- a.  $\frac{1}{2}$
- b. No value of  $x$  will work
- c.  $\frac{7}{30}$
- d.  $\frac{7}{10}$
- e. None of these



4. (5 pts) You choose an apple at random from a bowl with 7 green, 8 red, and 5 yellow apples. What are the odds that you do not choose a red apple?

- a. 3 to 2
- b. 2 to 3
- c. 3 to 5
- d. 2 to 5
- e. None of these

5. (5 pts) A grocery store manager has determined that the time spent waiting in line at the express checkout line is normally distributed with a mean of 62 seconds and a standard deviation of 15.5 seconds. The manager classified the longest 16% of wait times as poor, the next 37% of times as fair, the next 21% as good, and the remaining shortest times as excellent.

First, determine the minimum and the maximum wait times that would be considered fair, rounded to the nearest whole second. Then find the sum of these two times.

- a. 110 seconds
- b. 107 seconds
- c. 58 seconds
- d. 138 seconds
- e. None of these

6. (5 pts) A crate of 30 watermelons contains 11 that are seedless. If 6 watermelons are selected at random, what is the probability that at least 1 is seedless (rounded to 4 decimal places)?

- a. 0.2154
- b. 0.9543
- c. 0.7846
- d. 0.0457
- e. None of these

7. (5 pts) The birth weight for a baby born in a particular state in the year 2007 is normally distributed with a mean of 3400 grams and a standard deviation of 557 grams. If a healthy birth weight in this state is considered to be any value in the range of 2750 to 4000 grams, what is the probability that a randomly selected baby born in this state in 2007 would *not* have a healthy birth weight, rounded to four decimal places?

- a. 0.2623
- b. 0.7377
- c. 0.1407
- d. 0.1216
- e. None of these

8. (5 pts) The DJ for the End O' Lunch Crunch radio segment needs to organize a four-song playlist for tomorrow. He can choose from 3 different songs from Pearl Jam, 4 different songs from Green Day, 2 different songs from the All-American Rejects, and one song from Radiohead. If he randomly adds different four songs to the lineup, what is the probability that the first and last songs in the lineup are from Green Day?

- a.  $\frac{2}{15}$
- b.  $\frac{1}{35}$
- c.  $\frac{1}{14}$
- d.  $\frac{14}{125}$
- e. None of these

9. (5 pts) Each member of the Pi Mu Epsilon chapter of the Imaginary Institute of Technology must participate in exactly one service project during the fall semester. The following table represents a summary of the participation at the fall semester events.

	Tutor-a-thon 2008	5K Fun Run	Don't Drink and Derive	Garage Sale	Totals
Sophomores	5	1	12	1	19
Juniors	15	10	4	18	47
Seniors	32	7	14	7	60
Totals	52	18	30	26	126

What is the probability that a randomly selected member who participated in Tutor-a-Thon 2008 is a junior or a sophomore?

- a.  $\frac{4}{25}$
- b.  $\frac{11}{21}$
- c.  $\frac{5}{13}$
- d.  $\frac{26}{63}$
- e. None of these

10. A national car rental company has 2500 luxury class vehicles. The probability that a luxury vehicle is being rented on a given day is 0.46.

**Part A Workout** (4 pts). What is the *exact* mean and *exact* standard deviation of the daily number of luxury class vehicles being rented?

Mean: \_\_\_\_\_ number of luxury vehicles rented

Standard Deviation: \_\_\_\_\_ number of luxury vehicles rented

**Part B Multiple-Choice** (5 pts). Use the *appropriate normal distribution to approximate the binomial probability* that, on a randomly selected day, more than 1200 luxury vehicles are rented. Round your answer to five decimal places. Mark this answer on your Scantron for problem 10.

- a. 0.02136
- b. 0.02143
- c. 0.02357
- d. None of these
- e. 0.02349

11. (9 pts) Five of my students are named Chris and 3 of my students are named Rachel. I randomly pick 2 students from these 8 and count the number of Rachel's in my sample. Construct a probability distribution table. Give probabilities as exact fractions.

12. (10 points) Sergeant Schultz of the Podunk Police Squad collected the following information about the speeding tickets he issued daily in the past month.

<b>Speeding Tickets Issued</b>	0	1	4	7	8	10	11	16
<b>Number of Days</b>	4	1	8	3	5	8	1	1

If  $X$  represents the number of speeding tickets issued in a day, then determine the mean, median, mode, and variance for this random variable. Round answers to two decimal places, if needed.

Mean: \_\_\_\_\_ Median: \_\_\_\_\_ Mode: \_\_\_\_\_ Variance: \_\_\_\_\_

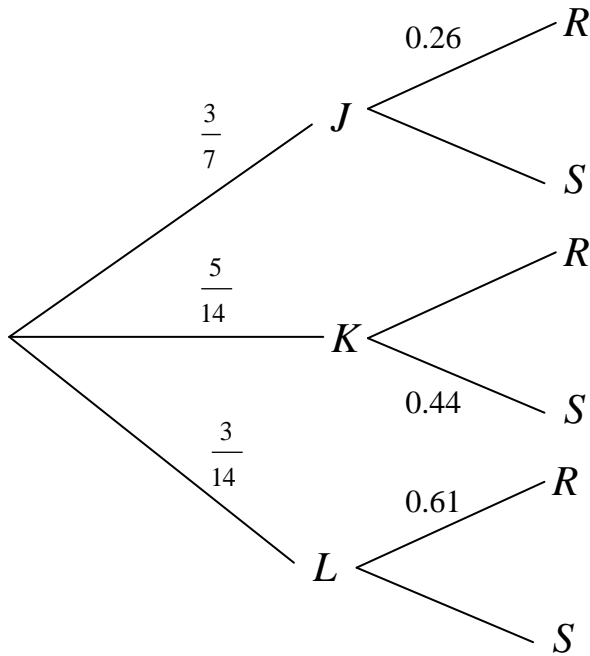
What are the units on the mean, median, and mode for this problem? \_\_\_\_\_

13. (8 pts) There are two snow cone stands in Wimberley: Laneisha's (L) and Shahzad's (S). Due to road construction the first week, 70% of the residents went to Laneisha's and the rest went to Shahzad's. Eighty (80) percent who went to Laneisha's the first week, went to Shahzad's the second week. Sixty (60) percent who went to Shahzad's the first week, returned to Shahzad's the second week and the rest went to Laneisha's. Construct a probability tree diagram for this problem. Clearly label your tree and indicate the meaning of any symbols that you use.

14. (6 pts) Sean wants to get insurance on his black lab's \$2000 leather and platinum collar. Assuming that the probability that the insurance company would need to replace the collar in the next year is 0.5%, and that the insurance company's expected net gain is \$35, what would the yearly insurance premium be?

15. (4 pts) If  $Z$  is the standard normal random variable, evaluate  $P(-0.45 < Z \leq 0.2)$  to 4 decimal places.

16. (9 points) Use the tree diagram to find the indicated probabilities. Give your answers as exact fractions in lowest terms.



a.  $P(L^C \cap R) =$

b.  $P(R | K) =$

c.  $P(K | S) =$