Math 141
Exam 2
Spring 2009
Scarborough
FORM **C**

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 **C**. On the Scantron also write in your instructor's name, sign your name, write today's date and write Exam II 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^{nd} +), Reset, ALL, Reset**
To turn on the correlation coefficient: **Catalog (2^{nd} 0), DiagnosticOn, Enter, Enter**

1. (5 pts) Sherry will purchase some plants for her flowerbed. A plant nursery has 7 Nandinas, 8 Mahonias, and 5 Yaupon Hollies. How many ways can she choose 5 plants with at least 4 Nandinas?

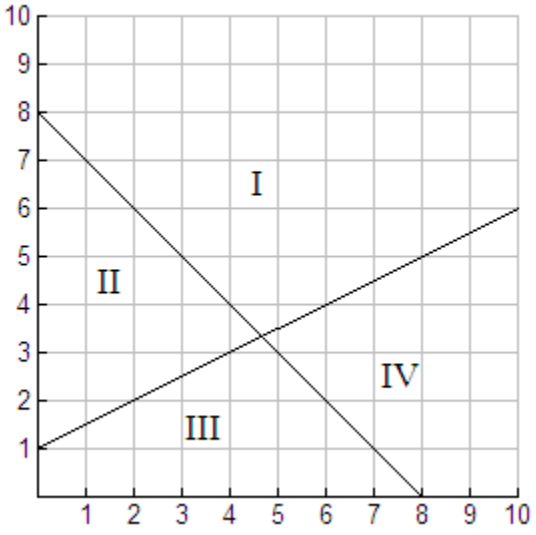
a. 455
b. 56
c. 9555
d. 476
e. None of these

2. (5 pts) A flower shop had 85 flowers left at the end of the day. Ten of the flowers were pink roses, 25 were roses, and 60 were pink flowers or roses. How many flowers were not pink?

a. 40
b. 60
c. 25
d. 35
e. None of these

3. (5 pts) Which region on the given graph corresponds to the solution region of the following system of linear inequalities?

$-3x + 6y \geq 6$
$-x - y \leq -8$
$x \geq 0$
$y \geq 0$



a. I
b. II
c. III
d. IV
e. None of these

4. (5 pts) Cornette Library has 5 black, 1 white, 3 red, and 2 green DVD cases that are not currently in use. The cases of each color are identical. In how many distinguishable ways can all of these cases be lined up on a shelf in the media storage room?

a. 1440
b. 27,720
c. 3,991,680
d. 39,916,800
e. None of these

5. (5 pts) An experiment with sample space $S = \{s_1, s_2, s_3, s_4, s_5\}$ has the following probability distribution:

Simple Event	$\{s_1\}$	$\{s_2\}$	$\{s_3\}$	$\{s_4\}$	$\{s_5\}$
Probability	p_1	p_2	0.12	p_4	0.13

Suppose that $A = \{s_1, s_2, s_5\}$. If $P(A^C) = 0.44$ and s_1 and s_4 are equally likely outcomes, find p_2.

a. 0.13
b. 0.25
c. 0.43
d. 0.11
e. None of these

6. (5 pts) A 6-character code is made from the digits 0-9 and the uppercase letters of the alphabet A-Z. How many codes are possible if the first and last symbol of the code must be different letters and the remaining symbols must be non-repeating digits?

a. 3,276,000
b. 3,407,040
c. 6,500,000
d. 6,760,000
e. None of these

7. (5 pts) Which of the following is false?

a. None of these
b. $\varnothing \in A^C \cap A$ for all sets A.
c. If $A \cap B = \varnothing$, then for all nonempty sets A and B, $A \subset A \cup B$.
d. If $n(A) = 5$ then there are 30 nonempty, proper subsets of A.
e. $A \subseteq A \cup B$ for all sets A and B.

8. (5 pts) If set $A = \{x \mid x$ is a letter in the word *zebra*$\}$, $B = \{b, r, a, z, e, n\}$, and universal set $U = \{a, b, e, n, r, s, z\}$, find $n(A^C \cap B)$.

a. 1
b. 0
c. None of these
d. 5
e. 7

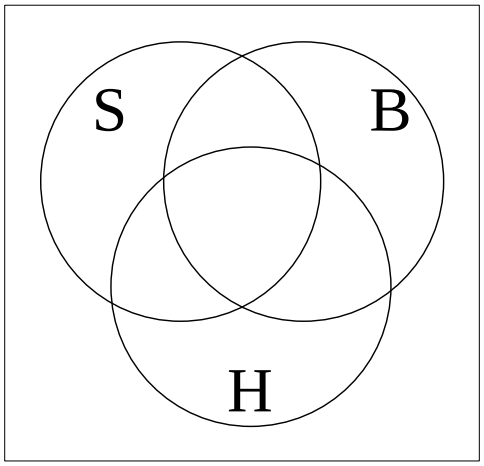
9. (5 pts) Events E and F are mutually exclusive. If $n(E) = 30$ and $n(F) = 40$, such that $n(U) = 90$, find $n\left(\left(E \cap F^C\right)^C\right)$.

a. 60
b. None of these
c. 90
d. 40
e. 0

10. Ninety (90) students were surveyed about their spring break plans, and the following data was collected.

- 29 students were doing a service project (*S*)
- 19 were only going to the beach (*B*)
- 12 were going home (*H*) and going to the beach
- 65 were doing a service project or were going home
- 4 were doing all three of these
- 16 were doing exactly two of these three
- 7 were doing a service project and going home

a. (8 pts) Use the information to fill in the provided Venn diagram below.



b. (5 pts) How many students surveyed were not going home? Mark this answer on your Scantron for problem 10.

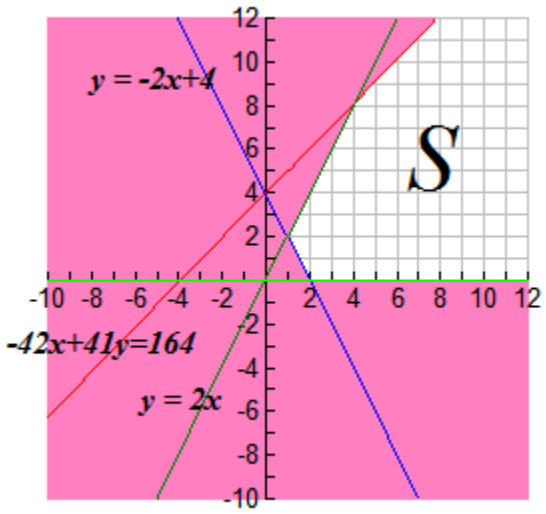
a. 62
b. 41
c. 47
d. None of these
e. 6

11. (5 pts) Four hundred eighty (480) people were surveyed regarding their favorite fruit. The results are shown below.

apples	bananas	kiwi	oranges	pears	watermelon	blueberries	raspberries
29	70	38	87	96	45	53	62

If one of these people was randomly chosen, what is the probability, *as an exact fraction in lowest terms*, his/her favorite fruit is not watermelon?

12. (10 pts) Find and label all corner points of the given feasible region *S*. Use the Method of Corners to find the exact maximum and minimum values of $G = 5x + 4y$ on *S*. Write NONE if a value does not exist.

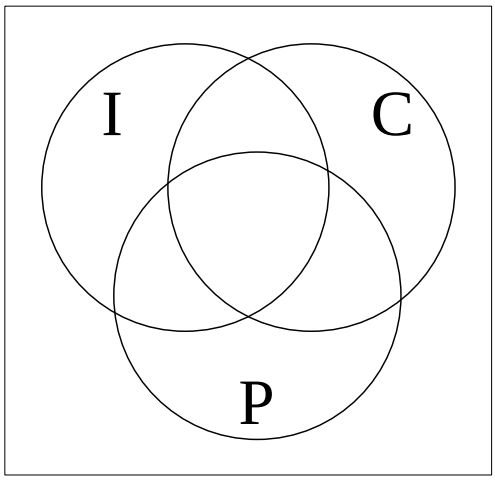


Maximum *G* = _____ at _____

Minimum *G* = _____ at _____

13. (7 pts) An experiment consists of first spinning a spinner, and then drawing a number. The spinner can only land in regions W or X. If the spinner lands on W, then the player randomly draws a number from a cup that has the numbers 1, 2, and 3 in it. If the player spins an X, then the player draws a number from a vase that contains the numbers 3 and 4. In roster notation, give the appropriate sample space for this experiment.

14. (4 pts) Stay Connected provides the citizens in the town of Universal Set (U) with Internet service (I), cable television service (C), and home phone service (P). Citizens may select one, two, three, or none of these services. Shade the Venn diagram below to indicate the set of all citizens of Universal Set who receive home phone service or do not receive cable and Internet service from Stay Connected.



15. (10 pts) Set up the following problem, but **DO NOT SOLVE**. Clearly define your variables.

Berry Juice makes two kinds of cranberry/raspberry drinks from cranberry juice, raspberry juice, and sugar: CranRasp Sweet and CranRasp Tart. Each kiloliter of CranRasp Sweet requires 0.2 kiloliters of cranberry juice, 0.4 kiloliters of raspberry juice, and 30 lbs. of sugar. Each kiloliter of CranRasp Tart requires 0.5 kiloliters of cranberry juice, 0.1 kiloliters of raspberry juice, and 10 lbs. of sugar. Berry Juice has 50 kiloliters of cranberry juice, 40 kiloliters of raspberry juice and 500 lbs. of sugar available. If Berry Juice makes a $3000 profit on each kiloliter of CranRasp Sweet and $2800 profit on each kiloliter of CranRasp Tart, how many kiloliters of each drink should be made to maximize profit?

16. (6 pts) Jasmine and Allen and four of their friends go to a baseball game. They all sit next to each other in the same row. How many ways can this be done if Jasmine and Allen sit next to each other?