

Name: Key

Math 150 Fall 2014 Test 2 October 14, 2014

There are twenty-five questions total with point values given below. Where indicated, write your answer in the space provided. Good luck!

Note: A deck of cards has 52 cards. There are four suites: hearts, diamonds, spades, and clubs. Each suite has 13 cards: 2-10, Jack, Queen, King, and Ace. Hearts and diamonds are considered red cards; spades and clubs are considered black cards.

1. (2 points) C Which of the following is not a subset of $\{1, 2, 3, 6, 9\}$?

- (a) $\{1, 2, 3\}$ (b) $\{\}$
(c) $\{1, 3, 10\}$ (d) $\{1, 2, 3, 6, 9\}$

2. (2 points) A If the $P(E) = 5/19$, which of the following are the odds in favor of E ?

- (a) 5:14 (b) 5:19
(c) 14:19 (d) 14:5

3. (2 points) D Let $A = \{a, b, c\}$, $B = \{b, e, g\}$, and $C = \{a, f, j\}$. Which of the following lists sets that are mutually exclusive?

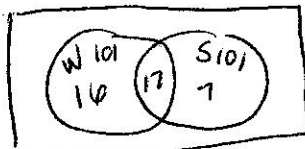
- (a) A and B (b) A and C
(c) A , B , and C (d) B and C

4. (2 points) B If two cards are drawn from an ordinary deck, which is the probability of drawing a spade on the first draw and a red card on the second draw?

- (a) .25 (b) .127
(c) .125 (d) .5

5. (2 points) D In our Math 150 class, 40 students are taking Writing 101 or Spanish 101, 33 students are taking Writing 101, 24 students are taking Spanish 101, and 17 are taking Writing 101 and Spanish 101. How many students are taking Writing 101, but not Spanish 101?

- (a) 33 (b) 24
(c) 18 (d) 16



(6-8) (20 points) Find the probability for the given sums when two fair dice are rolled.

6. $\frac{31}{36}$ Not 8

7. $\frac{4}{36}$ Even and less than 5

8. $\frac{7}{11}$ 10, given that atleast one die shows a 5

9. $\frac{1}{6}$ 2, given that you roll a double

10. (3 points) F True or False: If $A \subseteq C$ and $B \subseteq C$, then $n(A) = n(B)$.

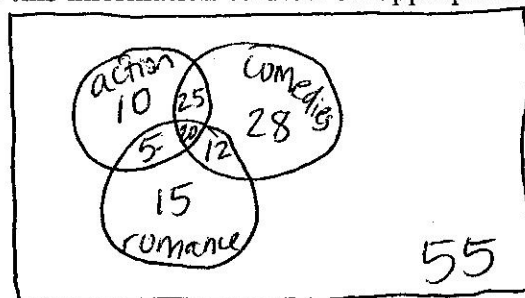
11. (2 points) T True or False: $n(A) + n(A') = n(U)$

12. (3 points) T True or False: For any set K , $K \cap K' = \emptyset$.
13. (2 points) F True or False: For any set W , $\{\emptyset\} \subseteq W$.

(14-17) 170 Students were asked the question "What type of movie do you like - action (A), comedy (C), or romance (R)?" The results are listed below:

- 60 liked action movies;
- 85 liked comedies;
- 52 liked romance movies;
- 45 liked action and comedies;
- 25 liked action and romance;
- 32 liked comedies and romance;
- 20 liked action, comedies, and romance.

14. (5 points) Use this information to draw an appropriate Venn diagram.



15. (3 points) 15 How many students liked action movies, but not comedies?
16. (3 points) 55 How many students didn't like action, romance, nor comedies?
17. (3 points) 28 How many students liked comedies, but not action nor romance?

(18-19) (10 points) Use the sets listed to answer the following:

$$U = \{-3, -2, -1, 0, 1, 2, 3\}, \quad A = \{-3, 0, 3\}, \quad B = \{-2, -1, 0, 1, 2\}, \quad C = \{-3, -1\}, \quad D = \{0\}$$

18. $(C \cup D)'$: $C \cup D = \{-3, -1, 0\}$ so
 $(C \cup D)' = \{-2, 1, 2, 3\}$

19. $(D' \cup A') \cap B$: $D' = \{-3, -2, -1, 1, 2, 3\}$, $A' = \{-2, -1, 1, 2\}$ so $D' \cup A' = \{-3, -2, -1, 1, 2, 3\}$
 $(D' \cup A') \cap B = \{-2, -1, 1, 2\}$

20. (3 points) 0 Let A and B be mutually exclusive events with $P(A) = .5$ and $P(B) = .3$. What is $P(A \cap B)$?

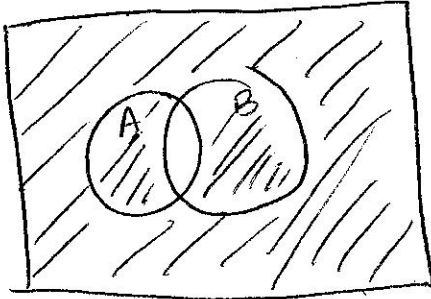
21. (3 points) .14 Let A and B be independent events with $P(A) = .35$ and $P(B) = .4$. What is $P(A \cap B)$?

(22-23) (10 points) Draw a Venn diagram and shade the given set in it.

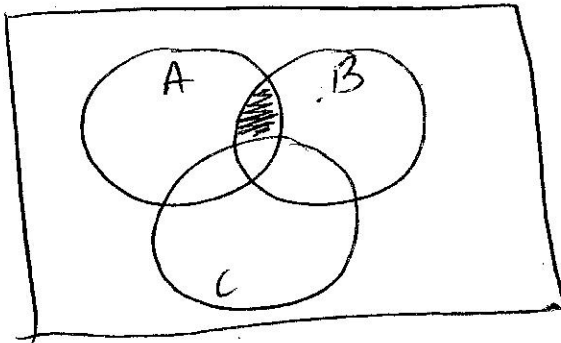
22. $B' \cup A'$

23. $A \cap (B \cap C')$

22.



23.



24. (10 points) A jar contains 4 red, 5 green, and 3 yellow marbles. If three marbles are chosen in succession without replacement, find the probability that all chosen marbles are green.

$$\frac{5}{12} \times \frac{4}{11} \times \frac{3}{10} = \frac{1}{22}$$

25. (10 points) The following table gives the results of a survey on red-green color blindness in men and women. C represents that a person is color blind:

Sex	C	C'	Total
Male	.042	.485	.527
Female	.007	.466	.473
Total	.049	.951	1

Given that the responder is color-blind, what is the probability that the responder is male?

$$P(\text{Male} | C) = \frac{.042}{.049} = .857$$