

Name _____

Math 102
Practice for Test 3

Show your work and write all fractions and ratios in simplest form for full credit.

1. If you draw a single card from a standard 52-card deck what is $P(\text{King} \mid \text{face card})$? (3 pts).

1. _____

2. The accompanying table shows the number of people in a tennis tournament. The table shows the distribution of participants: (2 pts/prob)

	Under age 21	21 years and older
Male	17	41
Female	29	38

- a. What is the probability of choosing a female?

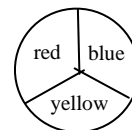
2.a. _____

- b. What are the odds in favor of choosing a male?

b. _____

3. A coin is flipped twice and a spinner is used once (like the one to the right is spun)

- a. Use a tree diagram to list the sample space for this experiment. (2 pts/problem)



- b. What is number of ways at least one heads is flipped?

b. _____

- c. What is the probability that the outcome is HTR?

c. _____

- d. What is the probability that a two tails are flipped?

d. _____

4. What is the probability of being dealt all face cards in a poker hand from a standard 52 card deck? (3 pts)

4. _____

5. What are the odds against Tiffany winning if the probability that Tiffany wins is $\frac{7}{12}$? (2 pts)

5. _____

6. The Farmstock Police Department is running a raffle with a grand prize worth \$600, and two other prizes each worth \$100. There are 1,200 tickets sold at \$1 each.

a. What is the expected value of one raffle ticket? (3 pts)

a. _____

b. If this were a “fair game”, what would the cost of a ticket be? (2 pt)

b. _____

7. a. How many ways can three people be selected to use their phones to text from a class of 17? (2 pts/problem)

7.a. _____

b. A lock has numbers 0-49 on its dial. How many three-number codes are possible?

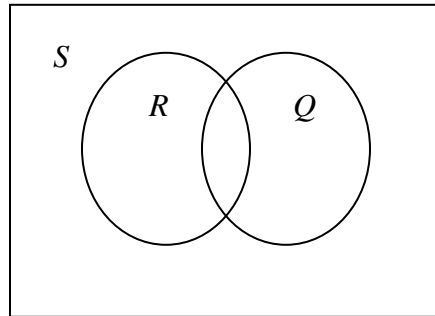
b. _____

8. What is the probability of rolling a pair of dice and getting a sum greater than 4? (Hint: list the complement 3 pts)

8. _____

9. Explain what is meant by $P(\text{Brown Hair} | \text{a member of your family})$.

10. Given $P(R) = 0.33$, $P(Q) = 0.45$, and $P(R \cap Q) = 0.15$. Fill in the Venn diagram and determine the following probabilities: (2 pts/problem)



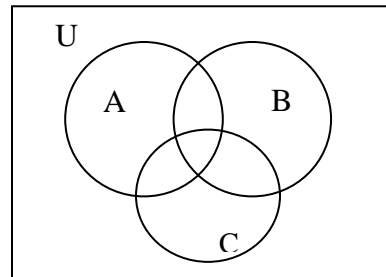
- a. $P(Q')$
 b. $P(R \cup Q)$
 c. $P(R | Q)$

10.a. _____

b. _____

c. _____

11. Shaded the region $(A \cap C) \cup B$ (3 pts)



12. In a survey of 110 MSUM students there were 19 graphic design majors, 28 music majors, and 35 communications majors. Seven students were double majoring in communications and graphic design, one was double majoring in graphic design and music, two were double majoring in music and communications, and no one was majoring in all three.

- a. Create a Venn diagram for the problem described above (3 pts).



- b. What is the probability a student is majoring in music or communications or graphic design? (2 pts)

b. _____

- c. What is the probability a student is only majoring in graphic design?
 (2 pts)

c. _____

13. How many different arrangements can be formed from the letters: FRIDAY? (2 pts)

13. _____

14. How many different arrangements can be formed from the letters: SUMMER? (3 pts)

14. _____

15. A primary zip code is made up of five-digits. How many zip codes end with 63? (2 pts)

15. _____

16. If Cai is choosing his clothes for the day and she has five shirts, four pair of pants, and four pair of shoes, how many different outfits are possible (clashing allowed)? (2 pts)

16. _____

17. A ball is randomly selected from a jar containing 20 green balls, 12 brown balls, and 6 white balls. (2 pts/problem)

a. P (a brown ball is chosen)

a. _____

b. P (a non-green ball is chosen)

b. _____

18. A couple is planning to have 4 children. The chance of having a son is equal to the chance of having a daughter. What is the probability that they have more than 1 daughter? (4 pts)

18. _____

19. List Pascal's Triangle below. (2 pts/problem)

a) In Pascal's Triangle circle the number of two-element subsets chosen from a five-element set is found.

b) In Pascal's Triangle draw a square around the number that represents ${}_4C_1$.

20. Identify each as a permutation or combination, DO NOT SOLVE these three. (1 pt/prob.)

a. A social security number consists of nine digits. How many different social security numbers are possible if repetition of digits is not permitted?

20.a. _____

b. A sample of 10 MP3 players from the 1000 manufactured will be selected and tested for defects. In how many ways can this be done?

b. _____

c. A lottery game contains 60 numbered white balls and 20 numbered red balls. In how many ways can we select a group of 5 white and one red?

c. _____

21. Two cards are randomly selected from a standard deck, without replacement.

a. What is the probability that the first card is a king and the second card is not a king? (3 pts)

21.a. _____

b. What is the probability the cards are clubs or red? (3 pts)

b. _____

22. Find the following: (1 pt/problem)

a. ${}_{24}P_7$

22.a. _____

b. ${}_{12}C_3$

b. _____

c. $\frac{7!}{4!3!}$

c. _____

23. If the odds in favor of Minnesota winning this week are 6:17, what is the probability that Minnesota wins? (2 pts)

23. _____

24. What are three basic properties of probability? (3 pts)

25. Complete a truth table to determine if the argument is valid or invalid. (4 pts)

$a \rightarrow d$	_____
$_ _ \underline{a} _ _$	_____
$\therefore d$	_____

25. _____

26. Write the following set $\{0, 1, 2, 3, \dots, 18\}$ in set-builder notation. (2 pts)

26. _____

27. Write the negation of: "At least one of the students will finish this test in half an hour." (2 pts)
