Name_____

Math 110
Review of Chapters 2-4

I. Complete as directed showing appropriate work, and writing fractions in simplest form.

1. A couple is planning to have 5 children. The chance of having a son is equal to the chance of having a daughter. What is the probability that they have at most one son?

1._____

2. A box contains a red, a yellow, and two green marbles. Two marbles are chosen in succession without replacement. Use a diagram to list the sample space for this experiment.

3. The probability that Rick will win a game is $\frac{5}{11}$.

a) What is the probability that Rick will lose?

3.a._____

b) What are the odds in favor of Rick winning?

b._____

4. What is the probability of drawing a heart or king from a standard deck of cards?

4._____

5. The Comstock Police Department is running a raffle in which the grand prize is $800, and the other prize is $100. If 2,500 tickets are sold at $1 each answer these questions:

a. What is the average amount, per ticket, one can expect to win? ($\mathbf{E_{winning}}$)

a._____

b. If this were a "fair game", then what would the cost of a ticket be?

b._____

c. What is "the average value of one play"?

c._____

7. In general how is theoretical probability calculated?

Probability (event) =

8. List two characteristics of experimental probability.

_____

_____

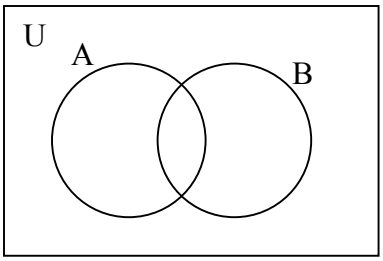
9. What is the probability of rolling a pair of dice and getting a sum of 5?

9._____

10. Determine if the argument is valid or invalid via a truth table.

$P \vee Q$
$\sim P$
$\sim Q$

11. Shade $A' \cap B$



12. In a survey of 64 MSUM students there were 30 that were education majors, 20 business majors, and 11 mass communications majors, three students were double majoring in mass communications and business, and one was double majoring in education and mass communications.

a. Create a Venn diagram for the problem described above.

b. What is the probability a student has a major other than one of these three listed.

b._____

c. What is the probability a student has a double major.

c._____

13. How many different arrangements can be formed from the letters: SPRING?

13._____

14. How many different arrangements can be formed from the letters: TESTING?

14._____

II. True or False, if false correct the statement to make it true.

15. There are 30 ways to arrange two objects chosen from six different items, when order does not matter.

_____ _____

16. If Jill is choosing an outfit to wear and she has six shirts, four pair of pants, and three pair of shoes, then she has 13 different outfits possible.

_____ _____

17. $A' \cup B' = (A \cup B)'$

_____ _____

18. Given the set {1, 2, 3, 4, 5} another way of writing this set is $\{x| x < 6\}$.

_____ _____

19. A conjunction is true only when both statements are true.

_____ _____

20. The rolling of a pair of dice and getting an even sum or a sum that is divisible 5 is an example of mutually exclusive events.

_____ _____

21. If $\sim R \vee Q$ is false, $R \wedge \sim Q$ is _____.

III. Complete as directed.

21. A coin is tossed and a die is rolled. Let
event H = a head appears
event E = an even number appears
event T = a tail or a two or a four appears (but not both a tail and a two or four)

a. Find *P*(H or E)

21.a._____

b. Find *P*(H or T)

b._____

22. Three cards are randomly selected from a standard deck, without replacement.

a. What is the probability that all three cards are spades?

a._____

b. What is the probability that the first two cards are kings and the third card is an ace?

b._____

c. What is the probability all three cards are clubs or jacks?

c._____

23. Jonelle finds a bike lock that has a four combination each digit ranges from 0-9. How many possible arrangements could she try before guessing the right arrangement?

23._____