

Math 110 Chapter 7, Sections 1, 2, 3, and 4, Review

1. Determine which of the following are written correctly.

- a. $7 \in \{5,6,7,8,9\}$
- b. $\{4,5\} \in \{1,2,3,4,5,6,7\}$
- c. $\emptyset \subseteq \{a,b,c\}$
- d. $c \subset \{a,b,c,d\}$
- e. $\{12,13\} \subseteq \{13,12\}$

2. Given $W = \{a,b,c,d,e,f,g\}$

- a. $n(W) = \underline{\hspace{2cm}}$
- b. How many subsets will W have? $\underline{\hspace{2cm}}$

3. a. If $P(E) = .93$, then $P(E') = \underline{\hspace{2cm}}$

b. If $P(F') = \frac{2}{5}$, then $P(F) = \underline{\hspace{2cm}}$

4. Given $P(T) = .32$

- a. What are the odds in favor of T ? $\underline{\hspace{2cm}}$
- b. What are the odds against T ? $\underline{\hspace{2cm}}$

Given $P(H) = \frac{7}{12}$

- c. What are the odds against H ? $\underline{\hspace{2cm}}$
- d. What are the odds in favor of H ? $\underline{\hspace{2cm}}$

e. If the odds in favor of Q are 8:3, what is the probability of not Q ?

f. If the odds against R are 12:5, what is the probability of not R ?

5. Write the sample space for the following.

- a. A die is rolled and then a coin is tossed.
- b. A bag contains 4 marbles, one each of red, blue, yellow and green.
A box contains 3 cards with pictures of balls, a baseball, soccer ball and football.
A marble is chosen and then a card is chosen.

6. Given $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$

$A = \{1, 2, 4, 6, 7\}$

$B = \{2, 4, 6, 8\}$

$C = \{4, 5, 6, 8\}$

Find:

a. $A \cap C$

b. $B \cup C'$

c. $A' \cup (B \cap C)$

d. $(B' \cup A) \cap C$

e. $\emptyset \cap B'$

f. $(A \cup C') \cup \emptyset$

7. A survey of 45 shoppers at the mall gave the following results.

27 shoppers used credit cards

16 shoppers used credit cards and cash

32 shoppers used credit cards or cash

- Construct a Venn diagram with this information.
- How many shoppers used cash?
- How many shoppers used only credit cards?
- How many shoppers used neither credit cards nor cash?

8. In response to the recent writers' strike the TV producers are offering 3 new reality shows for the winter, Animal Antics, Hospital Horrors, and Sports Out of Control. In a survey of a sample audience the viewers indicated which of the shows they liked.

23 viewers like Animal Antics

12 liked Animal Antics and Hospital Horrors

18 liked only Sports Out of Control

7 liked all three shows

2 liked Animal Antics and Sports Out of Control but not Hospital Horrors

30 liked Sports Out of Control

26 liked Animal Antics or Hospital Horrors but not Sports Out of Control

6 didn't like any of the shows

- Construct a Venn diagram with this information.
- How many people were surveyed?
- How many liked Sports Out of Control and Hospital Horrors?

- d. How many liked at least 2 of the shows?
- e. How many liked Sports Out of Control or Animal Antics but not Hospital Horrors?
- f. How many liked exactly one of the shows?
- g. How many liked only Hospital Horrors?
- h. How many liked Animal Antics and Hospital Horrors but not Sports Out of Control?

9. A survey of people of various age categories revealed the following information about how they like to spend their vacation.

	Stay at Home (H)	Take a Cruise (C)	Travel Abroad (A)	Totals
Ages				
20 - 34 (Y)	12	54	42	108
35 - 49 (M)	23	45	27	95
50 - 64 (O)	48	36	18	102
Totals	83	135	87	305

Using the letters given find the number of people in each of the following sets.

- a. $M \cap C$
- b. $H \cup O$
- c. $O \cup (C \cap Y)$
- d. $Y' \cup A$
- e. $M' \cap (H \cup C)$
- f. $O' \cap (C' \cap A')$

10. Sketch a Venn diagram and use shading to show the following sets.

- a. $(A \cap B) \cup A'$
- b. $(A \cap B') \cup C$
- c. $C \cap (B \cup A')$

11. Given $P(A) = .30$, $P(B) = .34$ and $P(A \cup B) = .53$.

Find

- a. $P(A \cup B)'$
- b. $P(A \cap B')$
- c. $P(B' \cup A)$

12. One card is drawn from a deck of 52. Find the probability of drawing a

- a. jack
- b. 7 or ace

- c. 7 and ace
- d. king and spade
- e. 4 or a heart

13. A clown is holding 15 balloons. 6 were red, 3 are yellow, 4 are blue and 2 are green. If he selects a balloon at random find the following.

- a. the probability the balloon is not blue
- b. the odds the balloon is green
- c. the odds the balloon is not red or green

14. a. If the odds that Jim's team wins the basketball tournament are 7:3, find the probability that Jim's team will win and the probability that Jim's team will lose.

b. If the odds that a given flight from Huntsville to Atlanta will be on time are 5:4, what is the probability the flight will be late?

c. If $P(K) = \frac{7}{10}$ what are the odds against K?

15. A survey of breakfast patrons at the local diner gave the following results. 67% liked coffee, 20% liked only orange juice, and 15% liked both. Find the probability that a given patron at the diner likes

- a. only coffee
- b. orange juice
- c. neither
- d. coffee or orange juice

16. In a survey of the dogs in my neighborhood I discovered that 92% of the dogs like Alpo or Purina brand dog food, 55% like Alpo and 70% like Purina. How many dogs liked

- a. only Purina
- b. neither

Be prepared for short answer questions over vocabulary or "short" problems like these.

17. If A and B are mutually exclusive events, then $P(A \cap B)$ is _____

~~18. Write $S = \{7, 8, 9, 10\}$ in set builder notation.~~

~~19. Write the set $L = \{x \in N, 12 \leq x < 18\}$ in roster form.~~

20. The sum of the probabilities of all the possible outcomes of a given event is _____

21. The list of all the outcomes of an event is the _____

22. All probabilities lie between _____ and _____ inclusive.

23. The probability of not E is equal to _____

Answers:

1. $7 \in \{5,6,7,8,9\}$, $\emptyset \subseteq \{a,b,c\}$, $\{12,13\} \subseteq \{13,12\}$

2. a. 7 b. 128

3. a. .07 b. $\frac{3}{5}$

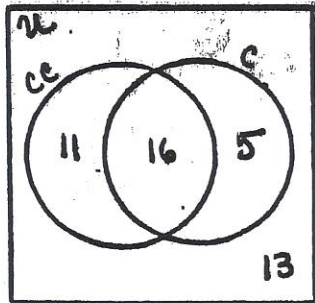
4. a. 8:17 b. 17:8 c. 5:7 d. 7:5 e. $\frac{3}{11}$ f. $\frac{12}{17}$

5. a. {1H, 2H, 3H, 4H, 5H, 6H, 1T, 2T, 3T, 4T, 5T, 6T}

b. {rB, rS, rF, bB, bS, bF, yB, yS, yF, gB, gS, gF}

6. a. {4, 6} b. {1, 2, 3, 4, 6, 7, 8} c. {3, 4, 5, 6, 8} d. {4, 5, 6} e. \emptyset f. {1, 2, 3, 4, 6, 7}

7. a.

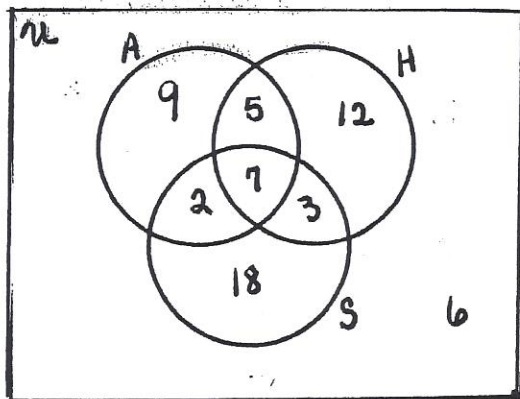


b. 21

c. 11

d. 13

8. a.



b. 62

c. 10

d. 17

e. 29

f. 39

g. 12

h. 5

9. a. 45

b. 137

c. 156

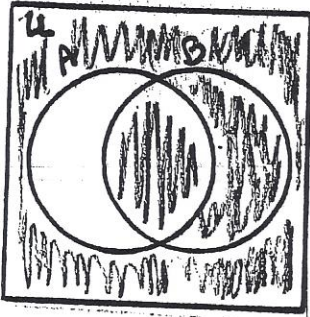
d. 239

e. 150

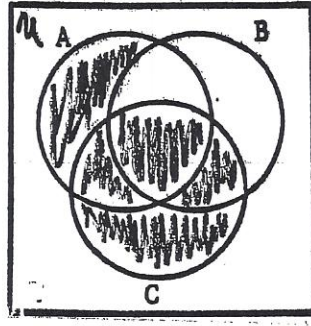
f. 35

10.

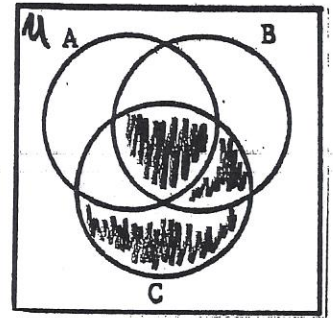
a.



b.



c.



11. a. .47 b. .19 c. .77

12. a. $\frac{1}{13}$ b. $\frac{2}{13}$ c. 0 d. $\frac{1}{52}$ e. $\frac{4}{13}$

13. a. $\frac{11}{15}$ b. 2:13 c. 7:8

14. a. $P(\text{win}) = \frac{7}{10}$ $P(\text{lose}) = \frac{3}{10}$
b. $P(L) = \frac{4}{9}$
c. 3:7

15. a. .52 b. .35 c. .13 d. .87

16. a. .37 b. .08

17. 0

18. $S = \{x | x \in N, 7 \leq x \leq 10\}$ or $S = \{x | x \in N, 6 < x < 11\}$,

19. $L = \{12, 13, 14, 15, 16, 17\}$

20. one

21. sample space

22. 0 and 1

23. $P(E') = 1 - P(E)$