Math 110, Chapter 7, sections 5 and 6 and Chapter 8, sections 1 and 2 Review

1. Two cards are drawn without replacement from an ordinary deck of 52 cards. Find the probabilities of the following results.

   a. the second is a face given the first is a jack
   b, the first is a jack and the second is a face
   c. a jack and a 7 are drawn
   d. both are sevens
   e. the second is a 2 given the first is a queen

2. Individuals are asked which network they watch for the evening news. The results are summarized as follows.

Viewers	ABC	NBC	CBS	Other	Total
Men	30	20	40	25	115
Women	50	10	20	15	95
Totals	80	30	60	40	210

If one of these individuals is selected at random, find the probability that the person

   a. watches ABC or NBC
   b. watches ABC given the individual is a woman
   c. is a woman given the individual is watching NBC
   d. is a man given the person is watching ABC or NBC
   e. is a woman and is watching NBC

3. Independence

   a. Shoppers at the Record Shop often have lunch across the street at the Coffee Bar. 50% of the shoppers buy a jazz CD, and 60% of the shoppers go across the street to the Coffee Bar for lunch. If 30% buy a jazz CD and go to the Coffee Bar for lunch, are buying a jazz CD and having lunch at the Coffee Bar independent? Be able to justify your answer.

   b. In a room of 35 people two different people will be selected without replacement and each will be awarded a door prize. Are the events of selecting the two people independent or dependent events? Why or why not?

   c. The probability that you are stopped by the police on Highway 3 is .04. Twenty-one percent of the cars on Highway 3 are red. The probability that you are stopped given you are driving a red car is 12%. Are driving a red car and being stopped on Highway 3 independent? Find the probability of being stopped and driving a red car.

4. In Anderson county 48% of the registered voters are men and 52% are women. Of the men, 56% voted Republican, and of the women 43% voted Republican

a. What is the probability that a voter was a man given the voter is Republican?

b. What is the probability that a voter selected at random did not vote Republican?

5. In Anderson county 64% of the residents vote and 81% read the newspaper. The probability that a person votes or reads the newspaper or both is 92%. If a person reads the newspaper, find the probability that the person votes.

6. In Anderson county 57% of the residents have a garden. Of the gardeners, 12 % have dogs. Of the residents who do not have a garden, 24% have dogs. If a resident is selected at random, find the probability

a. they do not have a dog.

b. they have a garden and a dog.

How many ways can it be done?

7. There are 6 paintings for the Mini-Art Show

a. How many ways can you line up 6 paintings for the show?

b. If 2 of the paintings are landscapes and the other 4 are portraits, how many ways can you line up the paintings if like paintings must be kept together?

c. If you plan to sell one of the landscaped and one of the portraits how many ways can you select the paintings to be sold?

d. How many ways can you award 3 prizes, $100 for first prize, $50 for second prize, and $25 for third prize. for 3 of the 6 paintings?

e. How many ways can you select 3 of the paintings to donate to a museum?

8. Five children from a class of 18 will be selected to get free yellow pencils. How many different selections are possible?

9. In the yard there are 3 crows, 5 blue jays, and 6 cardinals. How many ways can the birds line up if birds of a feather flock together?

10. From the birds listed in #9, how many ways can you select 3 birds, one of each type?

11. How many ways can you lineup 7 different books on the shelf if the dictionary must be the first book and the thesaurus must be second?

12. A club has 5 men and 8 women members. How many ways can they select a committee of 5 if there are to be 2 men and 3 women on the committee?

13. How many distinguishable ways can you arrange the letters in the word STATISTICS?

14. How many ways can 3 oranges be selected from a bag of a dozen oranges?

15. If a bag contains a dozen oranges and 2 of them are rotten, how many ways can a sample of 3 be drawn to include

a. exactly 1 rotten orange
b. no rotten oranges
c. at least one rotten orange

16. An identification code is to consist of 2 letters followed by 3 digits. How many different codes are possible if

a. the first letter must be a vowel and the first digit cannot be 0 or 1 and repetition is not allowed.
b. the first letter must be A , B, or C and the first digit must be 5 and repetition is not allowed.
c. any letter and any digit may be used and repetition is allowed.

17. Kelloggs is testing 5 oat, 7 wheat and 4 rice cereals. If Kellogg's plans to market 2 of the oat and 3 of the wheat and 2 of the rice cereals, how many combinations are possible?

18. Johnny is planning to purchase one CD by each of the following artists, Bing Crosby, Frank Sinatra and Dean Martin. The store has 8 CD's by Bing Crosby, 12 by Frank Sinatra and 4 by Dean Martin. In how many ways can Johnny make his selection?

19. Twelve people are in a drawing for 3 free vacations to be given away by the local radio station. The first vacation is a two week cruise to Alaska, and second is a weekend in Atlanta and the third is a day trip to the petting zoo in Memphis. How many different ways can the 3 vacations be awarded?

20. The book club president is creating a display for the next club meeting. She has 5 books that are mysteries and 6 that are historical novels.

a. How many ways can she line up the books if she wants a mystery to be first?
b. How many ways can she line up the books if she wants a mystery in the middle?
c. How many ways can she line up the books if a mystery is first and an historical novel is last?

Answers

1. a. $\frac{11}{51}$

   b. $\frac{11}{663}$

   c. $\frac{8}{663}$

   d. $\frac{1}{221}$

   e. $\frac{4}{51}$

2. a. $\frac{11}{21}$

   b. $\frac{10}{19}$

   c. $\frac{1}{3}$

   d. $\frac{5}{11}$

   e. $\frac{1}{21}$

3. a. yes, independent
   b. not independent
   c. not independent, .0252

4. a. .546
   b. .5076

5. .654

6. a. .8284
   b. .0684

7. a. 720
   b. 96
   c. 8
   d. 120
   e. 20

8. 8,568

9. 3,110,400

10. 90

11. 120

12. 560

13. 50,400

14. 220

15. a. 90
    b. 120
    c. 100

16. a. 72,000
    b. 5,400
    c. 676,000

17. 2,100

18. 384

19. 1,320

20. a. 18,144,000
    b. 18,144,000
    c. 10,886,400