Practice(chapter3)

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem.

1) Which of the following assignments of probabilities to the sample points *A*, *B*, and *C* is valid if *A*, *B*, and *C* are the only sample points in the experiment? 1) _____

A) $P(A) = \frac{1}{5}, P(B) = \frac{1}{5}, P(C) = \frac{1}{5}$

B) $P(A) = -\frac{1}{4}, P(B) = \frac{1}{2}, P(C) = \frac{3}{4}$

C) $P(A) = 0, P(B) = \frac{1}{14}, P(C) = \frac{13}{14}$

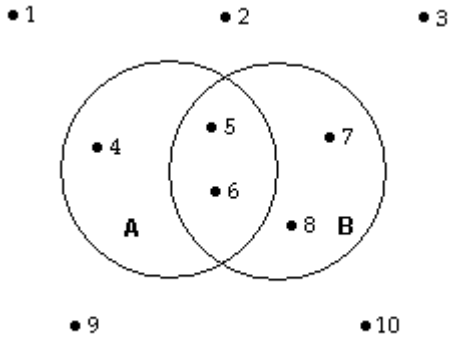
D) $P(A) = \frac{1}{9}, P(B) = \frac{1}{4}, P(C) = \frac{1}{2}$

2) Which number could be the probability of an event that is almost certain to occur? 2) _____

A) .01 B) .99 C) 1.01 D) .51

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

3) The accompanying Venn diagram describes the sample space of a particular experiment and events *A* and *B*. Suppose $P(1) = P(2) = P(3) = P(4) = \frac{1}{16}$ and $P(5) = P(6) = P(7) = P(8) = P(9) = P(10) = \frac{1}{8}$. Find $P(A)$ and $P(B)$. 3) _____



MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

4) The table displays the probabilities for each of the six outcomes when rolling a particular unfair die. Find the probability that the number rolled on a single roll of this die is less than 4. 4) _____

Outcome	1	2	3	4	5	6
Probability	.1	.1	.1	.2	.2	.3

A) .3 B) .7 C) .2 D) .5

5) A hospital reports that two patients have been admitted who have contracted Crohn's disease. Suppose our experiment consists of observing whether each patient survives or dies as a result of the disease. The simple events and probabilities of their occurrences are shown in the table (where *S* in the first position means that patient 1 survives, *D* in the first position means that patient 1 dies, etc.). 5) _____

Simple Events	Probabilities
SS	0.59
SD	0.10
DS	0.16
DD	0.15

Find the probability that at least one of the patients does not survive.

A) 0.26 B) 0.15 C) 0.10 D) 0.41

6) Evaluate $\binom{8}{2}$. 6) _____

A) 28 B) 16 C) 4 D) 56

7) Evaluate $\binom{6}{0}$. 7) _____

A) 0 B) undefined C) 1 D) 6

8) Evaluate $\binom{7}{7}$. 8) _____

A) 7 B) 1 C) 14 D) 49

9) Compute the number of ways you can select 3 elements from 7 elements. 9) _____

A) 35 B) 10 C) 21 D) 343

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

10) A college has 85 male and 75 female fulltime faculty members. Suppose one fulltime faculty member is selected at random and the faculty member's gender is observed. 10) _____

a. List the sample points for this experiment.
b. Assign probabilities to the sample points.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

11) Kim submitted a list of 12 movies to an online movie rental company. The company will choose 3 of the movies and ship them to her. If all movies are equally likely to be chosen, what is the probability that Kim will receive the three movies that she most wants to watch? 11) _____

A) $\frac{1}{1320}$ B) $\frac{1}{4}$ C) $\frac{1}{220}$ D) $\frac{1}{1728}$

12) Four hundred accidents that occurred on a Saturday night were analyzed. The number of vehicles involved and whether alcohol played a role in the accident were recorded. The results are shown below: 12) _____

	Number of Vehicles Involved			
Did Alcohol Play a Role?	1	2	3 or more	Totals
Yes	57	92	21	170
No	24	172	34	230
Totals	81	264	55	400

Suppose that one of the 400 accidents is chosen at random. What is the probability that the accident involved more than a single vehicle?

A) $\frac{81}{400}$ B) $\frac{319}{400}$ C) $\frac{11}{80}$ D) $\frac{21}{400}$

13) The table shows the political affiliations and types of jobs for workers in a particular state. Suppose a worker is selected at random within the state and the worker's political affiliation and type of job are noted. 13) _____

		Political Affiliation		
		Republican	Democrat	Independent
Type of job	White collar	10%	17%	12%
	Blue Collar	16%	18%	27%

Find the probability that the worker is a white collar worker affiliated with the Democratic Party.

A) 0.57 B) 0.39 C) 0.35 D) 0.17

14) The table displays the probabilities for each of the six outcomes when rolling a particular unfair die. Suppose that the die is rolled once. Let A be the event that the number rolled is less than 4, and let B be the event that the number rolled is odd. Find $P(A \cup B)$. 14) _____

Outcome	1	2	3	4	5	6
Probability	.1	.1	.1	.2	.2	.3

A) .2 B) .3 C) .5 D) .7

15) At a community college with 500 students, 120 students are age 30 or older. Find the probability that a randomly selected student is less than 30 years old. 15) _____

A) .24 B) .30 C) .12 D) .76

16) The table displays the probabilities for each of the six outcomes when rolling a particular unfair die. Suppose that the die is rolled once. Let A be the event that the number rolled is less than 4, and let B be the event that the number rolled is odd. Find $P(A \cap B)$. 16) _____

Outcome	1	2	3	4	5	6
Probability	.1	.1	.1	.2	.2	.3

A) .3 B) .2 C) .7 D) .5

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

17) Suppose that 62% of the employees at a company are male and that 35% of the employees just received merit raises. If 20% of the employees are male and received a merit raise, what is the probability that a randomly chosen employee is male or received a merit raise? 17) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

18) The table shows the political affiliations and types of jobs for workers in a particular state. Suppose a worker is selected at random within the state and the worker's political affiliation and type of job are noted. 18) _____

		Political Affiliation		
		Republican	Democrat	Independent
Type of job	White collar	18%	11%	14%
	Blue Collar	17%	20%	20%

Find the probability the worker is not an Independent.

A) 0.34 B) 0.29 C) 0.66 D) 0.37

19) Suppose that for a certain experiment $P(A) = .33$ and $P(B) = .29$. If A and B are mutually exclusive events, find $P(A \cup B)$. 19) _____

A) .03 B) .31 C) .38 D) .62

20) Suppose that for a certain experiment $P(A) = .47$ and $P(B) = .25$ and $P(A \cap B) = .14$. Find $P(A \cup B)$. 20) _____

A) .36 B) .72 C) .86 D) .58

21) Suppose that for a certain experiment $P(B) = .5$ and $P(A \mid B) = .2$. Find $P(A \cap B)$. 21) _____

A) .3 B) .1 C) .4 D) .7

22) Suppose that for a certain experiment $P(A) = .6$ and $P(B) = .3$. If A and B are independent events, find $P(A \cap B)$. 22) _____

A) .90 B) .18 C) .30 D) .50

23) Classify the events as dependent or independent: Events A and B where $P(A) = 0.4$, $P(B) = 0.3$, and $P(A \text{ and } B) = 0.12$. 23) _____

A) independent B) dependent

24) A researcher investigated whether a student's seat preference was related in any way to the gender of the student. The researcher divided a lecture room into three sections (1–front, middle of the room, 2–front, sides of the classroom, and 3–back of the classroom, both middle and sides) and noted where each student sat on a particular day of the class. The researcher's summary table is provided below. 24) _____

	Area 1	Area 2	Area 3	Total
Male	20	10	3	33
Female	10	12	17	39
Total	30	22	20	72

Suppose a person sitting in the front, middle portion of the class is randomly selected to answer a question. Find the probability that the person selected is female.

A) $\frac{5}{36}$ B) $\frac{10}{39}$ C) $\frac{1}{3}$ D) $\frac{10}{13}$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

25) A human gene carries a certain disease from a mother to her child with a probability rate of 0.60. That is, there is a 60% chance that the child becomes infected with the disease. Suppose a female carrier of the gene has four children. Assume that the infections, or lack thereof, are independent of one another. Find the probability that none of the children get the disease from their mother. 25) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

26) Four hundred accidents that occurred on a Saturday night were analyzed. The number of vehicles involved and whether alcohol played a role in the accident were recorded. The results are shown below: 26) _____

	Number of Vehicles Involved			
Did Alcohol Play a Role?	1	2	3 or more	Totals
Yes	54	96	20	170
No	24	177	29	230
Totals	78	273	49	400

Suppose that one of the 400 accidents is chosen at random. What is the probability that the accident involved alcohol or a single car?

A) $\frac{27}{200}$ B) $\frac{97}{200}$ C) $\frac{17}{40}$ D) $\frac{39}{200}$

1) C
2) B
3) $P(A) = .3125$; $P(B) = .5$
4) A
5) D
6) A
7) C
8) B
9) A
10) a. {male, female}

b. $P(\text{male}) = \frac{85}{160} = .53125$; $P(\text{female}) = \frac{75}{160} = .46875$

11) C
12) B
13) D
14) C
15) D
16) B
17) Using the Additive Rule, the probability is .62 + .35 – .20 = .77.
18) C
19) D
20) D
21) B
22) B
23) A
24) C
25) Let D be the event of a single child getting the disease.

$P(\text{none get the disease}) = P(D^c \cap D^c \cap D^c \cap D^c) = P(D^c)P(D^c)P(D^c)P(D^c)$
$= (0.4)(0.4)(0.4)(0.4) = \ = 0.0256$

26) B