

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**Find the indicated probability.**

- 1) College students were given three choices of pizza toppings and asked to choose one favorite. The following table shows the results. 1) _____

toppings	freshman	sophomore	junior	senior
cheese	13	15	18	27
meat	19	27	15	13
veggie	15	13	19	27

Among the juniors what is the probability that a student responded "meat"?

- A) 0.203 B) 0.292 C) 0.15 D) 0.068 E) 0.288
- 2) At a California college, 14% of students speak Spanish, 7% speak French, and 2% speak both languages. A student is chosen at random from the college What is the probability that the student speaks Spanish if she speaks French? 2) _____
- A) 0.190 B) 0.020 C) 0.286 D) 0.050 E) 0.143
- 3) The following contingency table provides a joint frequency distribution for a group of retired people by career and age at retirement. 3) _____

		Age at Retirement				Total
		50-55	56-60	61-65	Over 65	
Career	Attorney	12	47	92	33	184
	College Professor	9	32	87	45	173
	Secretary	21	45	63	49	178
	Store Clerk	18	44	70	50	182
	Total	60	168	312	177	717

Suppose one of these people is selected at random. Compute the probability that the person selected was a store clerk.

- A) 0.025 B) 0.254 C) 0.084 D) 0.099 E) 0.300

- 4) The contingency table below provides a joint frequency distribution for a random sample of patients at a hospital classified by blood type and sex. 4) _____

		Blood Type				Total
		O	A	B	AB	
Sex	F	97	96	23	9	225
	M	78	67	14	6	165
Total		175	163	37	15	390

If a person is selected at random from the sample, find the probability that the person has blood type A and is female.

- A) 0.246 B) 0.749 C) 0.589 D) 0.995 E) 0.427
- 5) A box contains 12 batteries of which 5 are still working. Anne starts picking batteries one at a time from the box and testing them. Find the probability that she has to pick 5 batteries in order to find one that works. 5) _____
- A) 0.013 B) 0.044 C) 0.017 D) 6.031 E) 0.001
- 6) You draw a card at random from a standard deck of 52 cards. Find the probability that the card is a spade given that it is not a diamond. 6) _____
- A) 0.077 B) 0.333 C) 0.5 D) 0 E) 0.25
- 7) An auto insurance company was interested in investigating accident rates for drivers in different age groups. The following table was based on a random sample of drivers and classifies drivers by age group and accident rate. 7) _____

		Age Group		
		Under 25	25-45	Over 45
Number of accidents in past 3 years	0	0.121	0.194	0.363
	1	0.080	0.075	0.103
	> 1	0.031	0.015	0.018

What is the probability that a person who had no accidents in the past three years is over 45?

- A) 0.535 B) 0.677 C) 0.484 D) 0.749 E) 0.363

- 8) You draw a card at random from a standard deck of 52 cards. Find the probability that the card is a face card given that it is a king. 8) _____
- A) 0.333 B) 0.231 C) 0.077 D) 0.25 E) 1

- 9) The following contingency table provides a joint frequency distribution for a group of retired people by career and age at retirement. 9) _____

		Age at Retirement				Total
		50-55	56-60	61-65	Over 65	
Career	Attorney	10	37	92	44	183
	College Professor	9	32	92	45	178
	Secretary	21	45	63	49	178
	Store Clerk	18	44	70	50	182
	Total	58	158	317	188	721

Find the probability that the person was a secretary or retired before the age of 61.

- A) 0.546 B) 0.404 C) 0.455 D) 0.306 E) 0.092
- 10) An IRS auditor randomly selects 3 tax returns from 54 returns of which 10 contain errors. What is the probability that she selects none of those containing errors? 10) _____
- A) 0.466 B) 0.541 C) 0.005 D) 0.534 E) 0.006
- 11) You are dealt a hand of three cards, one at a time. Find the probability that your cards are all face cards. 11) _____
- A) 0.010 B) 0.025 C) 0.013 D) 0.012 E) 0.250

- 12) An auto insurance company was interested in investigating accident rates for drivers in different age groups. The following table was based on a random sample of drivers and classifies drivers by age group and accident rate. 12) _____

		Age Group		
		Under 25	25-45	Over 45
Number of accidents in past 3 years	0	0.119	0.196	0.374
	1	0.085	0.068	0.093
	> 1	0.028	0.019	0.018

Suppose one of these people is selected at random. Compute the probability that the person has had more than one accident in the past three years.

- A) 0.028 B) 0.246 C) 0.232 D) 0.065 E) 0.311
- 13) You are dealt a hand of three cards, one at a time. Find the probability that you have at least one queen. 13) _____
- A) 0.068 B) 0.217 C) 0.213 D) 0.783 E) 0.204
- 14) A group of volunteers for a clinical trial consists of 81 women and 77 men. 18 of the women and 19 of the men have high blood pressure. If one of the volunteers is selected at random find the probability that the person has high blood pressure given that it is a woman. 14) _____
- A) 0.234 B) 0.513 C) 0.486 D) 0.222 E) 0.114

Determine whether the events are disjoint and give a reason.

- 15) Melissa is looking for the perfect man. She claims that at her college 35% of men are smart, 26% are funny, and 16% are both smart and funny. If Melissa is right, are being smart and being funny disjoint events? 15) _____
- A) Yes, the probability that a man is smart is the same as the probability that a man is smart given that he is funny.
- B) No, 16% are both smart and funny
- C) Yes, because $P(S \text{ or } F) = P(S) + P(F)$
- D) Cannot be determined from the information given
- E) Yes, no man is both smart and funny

- 16) At a California college, 23% of students speak Spanish, 5% speak French, and 3% speak both languages. Are speaking Spanish and speaking French disjoint events? 16) _____
- A) Yes, a student cannot speak both Spanish and French at the same time
 B) Cannot be determined from the information given
 C) Yes, because $P(S \text{ or } F) = P(S) + P(F)$
 D) No, 3% of students speak both languages
 E) Yes, the probability that a student speaks French is the same as the probability that a student speaks French given that they speak Spanish.

Determine whether the events are independent and give a reason.

- 17) In one town in the Pacific Northwest, only 23% of days are sunny. A company's records indicate that on sunny days 1.8% of employees will call in sick. When it is not sunny, 1.2% of employees will call in sick. Is calling in sick independent of sunshine? Explain. 17) _____
- A) Yes, the probability of an employee calling in sick does not depend on whether it is sunny.
 B) Yes, because $P(\text{sunny and employee calls in sick}) = P(\text{sunny}) \cdot P(\text{employee calls in sick})$
 C) No, it is possible for both things to happen
 $P(\text{sunny and employee calls in sick}) = (0.23) \cdot (0.018)$. This is greater than zero.
 D) No, the percentage calling in sick depends on whether it is sunny.
 When it is sunny, 1.8% call in sick. When it is not sunny, 1.2% call in sick
 E) No
 $P(\text{sunny and employee calls in sick}) = (0.23) \cdot (0.018) = 0.00414$
 $P(\text{not sunny and employee calls in sick}) = (0.77) \cdot (0.012) = 0.00924$
 These are not equal

- 18) The table shows the political affiliation of voters in one city and their positions on stronger gun control laws. 18) _____

	Stronger Gun Control	
	Favor	Oppose
Republican	0.08	0.33
Democrat	0.22	0.2
Other	0.13	0.04

Are party affiliation and position on gun control laws independent? Explain.

- A) No; 8% of voters both favor stronger gun control laws and are Republicans
 B) Yes;
 52.4% of Democrats favor stronger gun control laws and
 52.4% of Republicans favor stronger gun control laws
 C) Yes; a voter who favors stronger gun control laws cannot be both a Democrat and a Republican
 D) No; 52.4% of Democrats favor stronger gun control laws, but only 19.5% of Republicans favor them
 E) No;
 $P(\text{Democrat and Favor}) = 0.22$
 $P(\text{Republican and Favor}) = 0.08$
 These are not equal

Solve the problem.

- 19) The probability that a student at a certain college is male is 0.45. The probability that a student at that college has a job off campus is 0.33. The probability that a student at the college is male and has a job off campus is 0.15. If a student is chosen at random from the college, what is the probability that the student is male or has an off campus job? 19) _____

A) 0.63 B) 0 C) 0.47 D) 0.78 E) 0.93

- 20) According to a survey in one U.S. city, 48% of women between the ages and 25 of 35 are married, 40% are working full time, and 17% are married and working full time. If a woman between the ages of 25 and 35 is picked at random from the city, what is the probability that she is working full time or married but not both? 20) _____

A) 0.71 B) 0.29 C) 0.83 D) 0.88 E) 0.54

Provide an appropriate response.

- 21) Just how accurate are the weather forecasts we hear every day? The table below compares the daily forecast with a city's actual weather for a year. 21) _____

		Actual Weather	
		Rain	No rain
Forecast	Rain	25	60
	No rain	10	270

What percent of the time was the forecast correct?

A) 19.2% B) 6.8% C) 74% D) 76.7% E) 80.8%

- 22) A survey of autos parked in student and staff lots at a large university classified the brands by country of origin, as seen in the table. 22) _____

		Driver	
		Student	Staff
Origin	American	108	92
	European	36	18
	Asian	59	56

What percent of the American cars were owned by staff?

A) 46% B) 55.4% C) 124.3% D) 54% E) 24.9%

List the sample space and tell whether the events are equally likely.

- 23) A family has two children; record the genders in order of birth. 23) _____

A) {BB, BG, GB, GG}, equally likely
 B) {B, G}, equally likely
 C) {BB, BG, GB, GG}, not equally likely
 D) {BB, BG, GG}, not equally likely
 E) {BB, BG, GG}, equally likely

24) Roll a die eight times; record the length of the longest run of sixes.

24) _____

- A) {0, 1, 2, 3, 4, 5, 6, 7, 8}, equally likely
- B) {1, 2, 3, 4, 5, 6}, equally likely
- C) {1, 2, 3, 4, 5, 6, 7, 8}, not equally likely
- D) {0, 1, 2, 3, 4, 5, 6, 7, 8}, not equally likely
- E) {0, 1, 2, 3, 4, 5, 6}, not equally likely

Answer Key

Testname: CHAPTER 15 IN CLASS EXERCISES

- 1) E
- 2) C
- 3) B
- 4) A
- 5) B
- 6) B
- 7) A
- 8) E
- 9) C
- 10) D
- 11) A
- 12) D
- 13) B
- 14) D
- 15) B
- 16) D
- 17) D
- 18) D
- 19) A
- 20) E
- 21) E
- 22) A
- 23) A
- 24) D