Practice 04

4.3 Multiplication Rule and Conditional Probability
4.4 Counting Rules
4.5 Probability and Counting Rules

1) If a card is drawn from an ordinary deck of cards, and then a second card is drawn from the same deck without replacing the first card, these two events are _____. 1) _____

A) conditional B) mutually exclusive
C) dependent D) independent

2) Let A and B be events with $P(A) = 0.5$, $P(B) = 0.9$, and $P(A \text{ and } B) = 0.25$. Are A and B independent? 2) _____

A) Yes B) No

3) Let A and B be events with $P(A) = 0.4$, $P(B) = 0.6$, and $P(A \text{ and } B) = 0.24$. Are A and B independent? 3) _____

A) Yes B) No

4) According to popular belief, 80% of adults enjoy drinking beer. Choose a group of 2 adults at random. The probability that all of them enjoy drinking beer is: 4) _____

A) 0.400 B) 0.640 C) 0.500 D) 1.600

5) A coin is tossed 3 times. Find the probability that all 3 tosses are tails. 5) _____

A) $\frac{1}{8}$ B) $\frac{1}{3}$ C) $\frac{1}{6}$ D) $\frac{1}{9}$

6) Let A and B be events with $P(A) = 0.2$, $P(B) = 0.8$, and $P(B|A) = 0.3$. Find $P(A \text{ and } B)$. 6) _____

A) 0.24 B) 0.16 C) 0.67 D) 0.06

7) In a second grade class containing 14 girls and 10 boys, 2 students are selected at random to give out the math papers. What is the probability that both are girls? 7) _____

A) $\frac{7}{12} \cdot \frac{7}{12}$ B) $\frac{7}{12} \cdot \frac{13}{23}$ C) $\frac{7}{12} \cdot \frac{14}{23}$ D) $\frac{5}{12} \cdot \frac{9}{23}$

8) An unfair coin has a probability 0.4 of landing heads. The coin is tossed four times. What is the probability that it lands heads at least once? 8) _____

A) 0.25 B) 0.936 C) 0.9744 D) 0.8704

9) It has been reported that 3% of all cars on the highway are traveling at speeds in excess of 70 mph. If the speeds of four random automobiles are measured via radar, what is the probability that at least one car is going over 70 mph? 9) _____

A) 0.11 B) 0.89 C) 0.00000081 D) 0.12

10) Urn 1 contains 4 red balls and 3 black balls. Urn 2 contains 2 red balls and 3 black balls. Urn 3 contains 2 red balls and 6 black balls. If an urn is selected at random and a ball is drawn, find the probability it will be red. 10) _____

A) $\frac{2}{5}$ B) $\frac{57}{140}$ C) $\frac{1}{3}$ D) $\frac{1}{105}$

11) In a second grade class containing 14 girls and 8 boys, 2 students are selected at random to give out the math papers. What is the probability that the second student chosen is a boy, given that the first one was a girl? 11) _____

A) $\frac{8}{21}$ B) $\frac{7}{11} \cdot \frac{2}{3}$ C) $\frac{4}{11}$ D) $\frac{7}{11} \cdot \frac{8}{21}$

12) There are 2 blue balls, 4 red balls, and 2 white balls in a bag of balls. If a person selects two of the balls, what is the probability that the second one is blue given that the first one was white? 12) _____

A) $\frac{1}{4}$ B) $\frac{1}{7}$ C) $\frac{2}{7}$ D) $\frac{1}{2}$

13) The Gift Basket Store had the following premade gift baskets containing the following combinations in stock. 13) _____

	Cookies	**Mugs**	**Candy**
coffee	5	18	11
Tea	15	14	7

Choose 1 basket at random. Find the probability that it contains tea given that it contains mugs.

A) ≈ 0.438 B) ≈ 0.778 C) ≈ 0.563 D) ≈ 0.200

14) Below are listed the numbers of engineers in various fields by sex. Choose one engineer at random. Find *P*(electrical|male). 14) _____

	Mechanical	**Electrical**	**Biomedical**
Male	8,750	4,167	6,329
Female	3,270	1,183	5,923

A) 0.779 B) 0.114 C) 0.141 D) 0.217

15) If the letters A, B, C, D, E, and F are to be used in a five-letter code, how many different codes are possible if repetitions are *not* permitted? 15) _____

A) 720 B) 1,296 C) 7,776 D) 625

16) A store manager wants to display 5 different brands of toothpaste in a row. How many ways can this be done? 16) _____

A) 20 B) 24 C) 5 D) 120

17) When a die is rolled twice, there are _____ possible outcomes**.** 17) _____

A) 36 B) 18 C) 720 D) 6

18) There are 4 different mathematics courses, 5 different science courses, and 3 different history courses. If a student must take one of each, how many different ways can this be done? 18) _____

A) 15 B) 60 C) 120 D) 12

19) A business has seven locations to choose from and wishes to rank only the top three locations. How many different ways can this be done? 19) _____

A) 210 B) 5,040 C) 840 D) 420

20) How many different ways can a teacher select 3 students from a class of 15 students to each perform a different classroom task? 20) _____

A) 455 B) 1,320 C) 2,730 D) 45

21) On a TV game show, a contestant is shown 7 products from a grocery store and is asked to choose the three least-expensive items in the set. The three chosen items need not be in any particular order. In how many ways can the contestant choose the three items? 21) _____

A) 35 B) 840 C) 210 D) 6

22) *FizzFizz* soda comes in two varieties, regular and diet. If a researcher has 5 boxes of each, how many ways can he select 2 boxes of each for a quality control test? 22) _____

A) 50 B) 100 C) 49 D) 10

23) The numbers 1 through 8 are written in separate slips of paper, and the slips are placed into a box. Then, 4 of these slips are drawn at random. What is the probability that the drawn slips are "1", "2", "3", and "4", in that order? 23) _____

A) 0.01429 B) 0.34296 C) 0.01428 D) 0.000595

24) A bookcase contains 2 statistics books and 5 biology books. If 2 books are chosen at random, the chance that both are statistics books is 24) _____

A) $\frac{10}{21}$ B) $\frac{1}{21}$ C) $\frac{1}{11}$ D) $\frac{10}{11}$

25) Three statistics professors and seven chemistry professors are available to be advisors to a student organization. The student organization needs two of the professors to be advisors. If each professor has an equal chance of being selected, what is the probability that both professors are chemistry professors? 25) _____

A) 0.467 B) 0.100 C) 0.233 D) 0.111

26) A committee consist of 7 women and 10 men. Three members are chosen as officers. What is the probability that all three officers are women? 26) _____

A) 0.0698 B) 0.1765 C) 0.0515 D) 0.01163

27) Find the probability of selecting 5 science books and 5 math books from 10 science books and 15 math books. The books are selected at random. 27) _____

A) ≈ 0.0001 B) ≈ 0.0009 C) ≈ 0.2315 D) ≈ 0.0010

28) A football team consists of 20 freshmen and 20 sophomores, 12 juniors, and 5 seniors. Four players are selected at random to serve as captains. Find the probability that there are 2 sophomores and 2 freshmen. 28) _____

A) ≈ 0.0005 B) ≈ 0.0914 C) ≈ 0.2000 D) ≈ 0.3950

29) A football team consists of 18 freshmen and 18 sophomores, 15 juniors, and 12 seniors. Four players are selected at random to serve as captains. Find the probability that at least 1 of the students is a senior. 29) _____

A) ≈ 0.4195 B) ≈ 0.9999 C) ≈ 0.0162 D) ≈ 0.5805

Answer Key
Testname: STA2023_PRACTICE04

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