

I. State whether the events are independent or dependent.

Given Situation	Independent OR Dependent
1.) finishing in first, second, or third place in a 10-person race	
2.) choosing a pizza size and a topping for the pizza	
3.) seventy-five raffle tickets are placed in a jar where three tickets are then selected, one after the other, without replacing a ticket after it's chosen	
4.) two hundred thirty-two members of the freshmen class all vote by secret ballot for the class representative to the Student Senate	
5.) choosing an ice cream flavor and choosing a topping	
6.) choosing an offensive player of the game and a defensive player of the game in a professional football game	
7.) from 15 entries in an art contest, a camp counselor chooses first, second, and third place winners	
8.) the letters A through Z are written on pieces of paper and placed in a jar where four of them are selected one after the other but were replaced into the jar after each selection	
9.) Jillian is selecting two or more courses for her block schedule next semester where she must select one of three morning history classes and one of two afternoon math classes	
10.) each of six people guess the total number of points scored in a basketball game where each person writes down his or her guess without telling what it is	
11.) selecting a fiction book and a nonfiction book at the library	
12.) choosing the color and size of a pair of shoes	
13.) determining a 4-digit code where the digits can't be repeated	
14.) a 3-character password where the first and second character can be repeated letter and the last character can't be repeated from the first two characters	
15.) the letters and digits on a license plate	

II. Solve each problem using the Fundamental Counting Principle. Show work!!

- 16.) A surveying firm plans to buy a color printer for printing maps. It has narrowed its choice to one of three models. Each of the models is available with 2 gigabytes of RAM, 3 gigabytes of RAM, or 4 gigabytes of RAM. How many possible models and RAM does the firm have to choose?
- 17.) How many arrangements of three letter can be formed from the letter of the word MATH if any letter will be used more than once?
- 18.) Allan is playing the role of Oliver in the school's play. The wardrobe crew has presented Allan with 5 pairs of pants and 4 shirts that he can wear. How many possible costumes consisting of a pair of pants and a shirt does Allan have to choose from?
- 19.) The 10-member steering committee that is preparing a study of the public transportation needs of its town will select a chairperson, vice-chairperson, and secretary from the committee. No person can serve in more than one position. In how many ways can the three positions be filled?
- 20.) Jeanine has decided to buy a pick-up truck. Her choices include a V-6 engine or a V-8 engine, a standard cab or an extended cab, and 2-wheel drive or 4-wheel drive. How many possible models are there to choose from?
- 21.) A mail-order company that sells gardening tools offers rakes in two different lengths. Customers can also choose either a wooden, plastic, or fiberglass handle for the rake. How many different kinds of rakes are there?
- 22.) A Mexican restaurant offers chicken, beef, or vegetarian fajitas wrapped with either corn or flour tortillas, and topped with either mild, medium, or hot salsa. How many different choices of fajitas does a customer have?
- 23.) A briefcase lock has 3 rotating cylinders, each containing 10 digits. How many numerical codes are possible?
- 24.) A golf club manufacturer makes irons with 7 different shaft lengths, 3 different grips, 5 different lies, and 2 different club head materials. How many different combinations are offered?
- 25.) There are five different routes that a commuter can take from her home to the office. In how many ways can she make a round trip if she uses a different route coming and going?
- 26.) In how many ways can the four call letters of a radio station be arranged if the first letter must be W or K and no letters repeat?
- 27.) How many 7-digit phone numbers can be formed if the first digit cannot be 0 or 1, and any digit can be repeated?
- 28.) How many 7-digit phone numbers can be formed if the first digit cannot be 0, and any digit can be repeated?
- 29.) How many 7-digit phone numbers can be formed if the first digit cannot be 0 or 1, and if no digit can be repeated?
- 30.) How many 7-digit phone numbers can be formed if the first digit cannot be 0, and if no digit can be repeated?
- 31.) How many 6-character passwords can be formed if the first character is a digit and the remaining 5 characters are letters that can be repeated?
- 32.) How many 6-character passwords can be formed if the first and last characters are digits and the remaining characters are letters? Assume that any character can be repeated.