Name:_____ Hour: _____ Date: _____

NOTES: Section 10.1 – Apply the Counting Principle and Permutations

Goals: #1 - I can apply the fundamental counting principle.

#2 - I can use permutations to count.

#3 - I can use permutations with repetition to count.



Homework: Lesson 10.1 Worksheet

Example #1:

For a wedding dinner, you have a choice between soup or salad. You also have your choice of entree between beef, chicken, or fish. Lastly, you can choose between cake of a brownie. How many different choices does the wedding have for dinner?

Notes:

In many real-life problems, we can count the number of ways to perform a task. One way to do this is to use a _____.

Another way to count the number of ways to perform a task is by using the _____:

- _____: If one event can occur in m ways and another event can occur in n ways, then the number of ways that _____ events occur is _____.

- _____: If three events can occur in m, n and p ways, then the number of ways that _____ three events occur is _____.

Name:_____ Hour: _____ Date: _____

Example #2:

You are buying a pizza. You have a choice of 3 crusts, 4 cheeses, 5 meat toppings, and 8 vegetable toppings. Have many different pizzas with one crust, one cheese, one meat, and one vegetable can you choose?

Example #3:

The new configuration for a Wisconsin license plate is 3 letters followed by 4 digits.

a. How many different license plates are possible if letters and digits can be repeated?

b. How many different license plates are possible if letter and digits cannot be repeated?

You practice:

A town has telephone numbers that all begin with 329 followed by four digits.

a. How many different phone numbers are possible if the numbers can be repeated?

b. How many different phone numbers are possible if the numbers cannot be repeated?

Name:_____ Hour: _____ Date: _____

Notes:

An _____ of n number of objects is a _____.

Example: How many different ways can the letters A, B, and C be arranged?

The expression $3 \cdot 2 \cdot 1$ can also be written as _____. In mathematics, the symbol ! is called a _____.

Example: 7!

The number of _____ of n objects is _____.

Example #4:

Eight teams are competing in a baseball playoff.

a. In how many different ways can the baseball teams finish the competition?

b. In how many different ways can the baseball teams finish first, second, and third?

Notes:

The answer to part (b.) is called the number of _____ of 8 objects taken 3 at a time. This is denoted by:

In gneral, the number of _____ of r objects taken from a group of n distinct objects is denoted by _____ and given by this formula:

Name:_____ Hour: _____ Date: _____

Calculator practice:

1. ${}_8P_3$
2. ${}_{12}P_4$
3. ${}_{15}P_0$

Example #5:

You have 6 homework assignments to complete over the weekend. However, you only have time to complete 4 of them on Saturday. In how many orders can you complete 4 of the assignments?

Notes:

The number of _____ permutations of n objects where one object is repeated s_1 times, another is repeated s_2 times is given by the formula:

Example #6: Find the number of distinguishable permutations of the letters in

a. EVEN

b. CALIFORNIA

You practice:

1. Have many different ways can 4 raffle tickets be selected from 50 tickets if each ticket wins a different prize?

2. Find the number of distinguishable permutations of the letters in CINCINNATI.