

15.5

Fundamental Counting Principles

Learning Goal

Learn to apply the fundamental counting principles

Fundamental Counting Principle

- * A method used to find the total number of ways different events can occur

Fundamental Counting Principle

*choices made sequentially

- * Multiply the number of possibilities for each event
- * Possibilities for Event 1: m
- * Possibilities for Event 2: n
- * Possibilities for Event 2: p
- * Total Number of Possibilities: $m \cdot n \cdot p$



Example 1

There are 5 different flavors of ice cream. There are also three different types of cones to choose from. How many distinct selections of ice cream cones can be made?

Fundamental Counting Principle

- *choices are mutually exclusive
- *cannot occur at the same time

- * Sum of the number of possibilities for each event
- * Possibilities for Event 1: m
- * Possibilities for Event 2: n
- * Possibilities for Event 2: p
- * Total Number of Possibilities: $m + n + p$



Example 2

Rita needs to get to school. She has two choices: walk or ride the bus. There are 3 routes she can take to walk & 2 routes to ride. What is the total # of possible routes?



Example 3

How many positive integers less than 100 can be written using only the numbers 2,4,5?
(Consider # 1-digit cases & # of 2-digit cases)



Example 4

How many license plates of 3 symbols (letters & digits) can be made using at least one letter in each?

Example 5

Pat's Pizza place will prepare pizza w/ a thin crust, thick crust or in a deep dish style. There are 8 choices of toppings and 2 different cut-styles.

How many ways can you choose a 1-topping pizza?

Example 6

How many license plates of 2 symbols (letters & digits) can be made using at least one letter in each?

Example 7

How many odd numbers between 10 and 1000
start & end with the same digit?