Name Key Date Hour

# Intro to Probability – The Counting Principle

## Algebra 2 Trig G

***Independent Events*** – events whose outcomes do not affect each other

***Dependent Events*** – events whose outcomes affect each other

**State whether the following events are independent or dependent:**

1) choosing a shirt to wear and choosing a pair of shoes to wear I

2) 100 raffle tickets are placed in a box; three tickets are selected, one after the other, without being replaced D

3) finishing first, second, or third place in a 30-person race D

4) choosing a type of bread and a type of meat to put on a sandwich I

**Independent/Dependent Events examples:**

1) You are craving ice-cream so you go to Baskin Robbins 31 Flavors. You decide that 1 scoop will not be enough so you decide to go for 2 scoops. How many different combinations of 2 scoops are possible?


$\underset{\text{scoop 1 choices}}{31} \cdot \underset{\text{scoop 2 choices}}{31} = \boxed{961}$

2) A pizza place offers its customers 4 choices for crust, 5 choices for size, and 12 choices for toppings.

a) How many different 1 topping pizzas are possible?

$\underset{\text{crust}}{4} \cdot \underset{\text{size}}{5} \cdot \underset{\text{topping}}{12} = \boxed{240}$

b) How many different 2 topping pizzas are possible?

$4 \cdot 5 \cdot 12 \cdot 12 = \boxed{2880}$

c) How many different 2 topping pizzas are possible if you *cannot repeat* a topping? (DEPENDENT!)

$4 \cdot 5 \cdot 12 \cdot 11 = \boxed{2640}$

3) You are trying to plan a summer trip. You are going to California, Colorado, New York, Texas, or South Carolina. You can travel by car, train, or plane. You have a choice of staying at a Holiday Inn, Hyatt, Hilton, or Westin. How many different ways can you select a destination, mode of transportation, and hotel?

$5 \cdot 3 \cdot 4 = \boxed{60}$

4) Many ATM machines require a 4-digit code to access an account. How many codes are possible if you *cannot repeat a number*? How many codes are possible if you *are able to repeat numbers*?


$10 \cdot 9 \cdot 8 \cdot 7 = \boxed{5040}$

$10 \cdot 10 \cdot 10 \cdot 10 = \boxed{10{,}000}$

5) How many 5-character passwords can be formed if the first two characters are non-repeating letters and the last 3 characters are numbers?

$26 \cdot 25 \cdot 10 \cdot 10 \cdot 10 = \boxed{650{,}000}$