

Counting Techniques

- 1) A florist sells a mixed bouquet option where you can pick any two flower types from a list of five common flowers. How many different two flower combinations are possible?

- 2) A pizza restaurant is offering a special on two-toppings pizzas. If the restaurant features eight different pizza toppings, how many different two-topping pizza combinations are possible?

- 3) A certain restaurant sells one-scoop ice cream sundaes. You have the choice of an ice cream-flavor (vanilla, chocolate, or strawberry); a sauce (hot fudge or caramel); and a topping (nuts, sprinkles, cookie crumbles or strawberries). Given the choices, how many different one-scoop ice cream sundaes are possible?

- 4) A certain burger joint lists the following options on their "Build-a-Better-Burger" menu. According to the menu, you may build the burger of your choice for only \$7.95 by choosing any one item from each category.

Buns: Soft White, Whole Wheat, Lettuce Wrap or Pretzel Roll

Burger: Traditional beef burger, turkey burger or veggie patty

Cheese: Cheddar, pepperjack or swiss

Premium Topping: Bacon, avocado or sauteed mushrooms

How many different "Better Burger" options can be constructed by choosing one item from each Category?

- 5) In the student council elections, three students are running for president, four are running for vice president, two are running for treasurer and one is running uncontested for secretary. How many different possible student council teams could be elected from these students?
- 6) Two identical standard six-sided dice are rolled. How many distinct rolls are possible?
- 7) A scientist is performing an experiment in which one of 5 metals is exposed to one of 4 different corrosive substances for 24 hours to determine their relative reactivity. How many different samples of one metal and one corrosive substance will the scientist end up testing?

- 8) Each part of the genetic code actually consists of two halves, known as alleles. Offspring inherit one allele from each parent. When determining the probability of offspring inheriting certain genetic traits, scientists use capital letters to denote dominant alleles, alleles that code for traits that are always expressed. They use lower case letters to denote recessive alleles, alleles that code for traits that can be carried in genes without being expressed. For example an individual might be heterozygous brown eyed, meaning that their genes contain both an allele for brown eyes and an allele for blue eyes (Bb), but their eye color is brown. A certain pea plant can produce either dominant green (G) peas or recessive yellow (g) peas. Additionally, smooth peas are dominant (S) while wrinkled peas are recessive (s). How many different distinct genotypes of peas are possible?
- 9) In a certain state, license plates are created using any three of twenty-four letters (the state does not use O's or I's on plates), followed by any three digit number. Repeated letters and numbers are allowed. How many different license plate combinations are possible?